

=> fil reg
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STRUCTURE FILE UPDATES: 13 JUN 2010 HIGHEST RN 1227570-00-4
DICTIONARY FILE UPDATES: 13 JUN 2010 HIGHEST RN 1227570-00-4

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TSCA INFORMATION NOW CURRENT THROUGH January 8, 2010.

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REGISTRY includes numerically searchable data for experimental and
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=> fil hcap
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FILE COVERS 1907 - 14 Jun 2010 VOL 152 ISS 25
FILE LAST UPDATED: 13 Jun 2010 (20100613/ED)
REVISED CLASS FIELDS (/NCL) LAST RELOADED: Apr 2010
USPTO MANUAL OF CLASSIFICATIONS THESAURUS ISSUE DATE: Apr 2010

HCAPlus now includes complete International Patent Classification (IPC)
reclassification data for the second quarter of 2010.

CAS Information Use Policies apply and are available at:

<http://www.cas.org/legal/infopolicy.html>

This file contains CAS Registry Numbers for easy and accurate
substance identification.

=> d que 141

L4 1 SEA FILE=REGISTRY SPE=ON ABB=ON PLU=ON 7440-44-0/RN
 L5 438715 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L4
 L7 QUE SPE=ON ABB=ON PLU=ON (L5 OR CARBON#) (3A) (NANOTUB#
 OR NANOSTRUCTURE? OR NANOCRYST? OR NANOROD? OR NANOCOMPO
 SIT? OR NANOSCAL? OR NANOPARTICL? OR NANO(A) (TUB# OR STRU
 CTUR? OR CRYST? OR ROD? OR COMPOSIT? OR SCAL? OR PARTICL?
))
 L8 QUE SPE=ON ABB=ON PLU=ON (L5 OR CARBON#) (3A) (BRANCH?
 OR JUNCTION?) (3A) (NANOTUB# OR NANOSTRUCTURE? OR NANOCRYST
 ? OR NANOROD? OR NANOCOMPOSIT? OR NANOSCAL? OR NANOPARTIC
 L? OR NANO(A) (TUB# OR STRUCTUR? OR CRYST? OR ROD? OR COMP
 OSIT? OR SCAL? OR PARTICL?))
 L9 QUE SPE=ON ABB=ON PLU=ON METAL# OR METAL OXIDE# OR ME
 TAL BORIDE# OR METAL FLUORIDE# OR METAL SULFIDE#
 L10 QUE SPE=ON ABB=ON PLU=ON IMPREGNAT? OR PRECIPITAT? OR
 SOL GEL? OR CHEMICAL VAPOR DEPOSITION? OR CVD# OR SPUITE
 RING?
 L11 10042 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L7 AND L9
 L12 2154 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L10 AND L11
 L13 13 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L8 AND L12
 L14 13 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L8 AND L9 AND L10
 L15 13 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON (L13 OR L14)
 L16 61 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L8 AND CATALY?
 L17 37 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L16 AND L10
 L19 QUE SPE=ON ABB=ON PLU=ON (BRANCH? OR JUNCTION?) (3A) (L
 6 OR CARBON#) (3A) (NANOTUB# OR NANOSTRUCTURE? OR NANOCRYST
 ? OR NANOROD? OR NANOCOMPOSIT? OR NANOSCAL? OR NANOPARTIC
 L? OR NANO(A) (TUB# OR STRUCTUR? OR CRYST? OR ROD? OR COMP
 OSIT? OR SCAL? OR PARTICL?))
 L20 94 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L19 AND L11
 L21 30 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L20 AND PROC/RL
 L22 12 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L21 AND CATALY?
 L23 19 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L15 OR L22
 L24 21 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L17 AND PROC/RL
 L25 34 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON (L23 OR L24)
 L26 19 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L9 AND L25
 L27 28 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L10 AND L25
 L28 34 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON (L25 OR L26 OR
 L27)
 L29 QUE SPE=ON ABB=ON PLU=ON (LOADING? OR FEEDING? OR DEL
 IVERING? OR SUPPLYING?) (A) CATALYST?
 L30 QUE SPE=ON ABB=ON PLU=ON EVAPORATION? OR DISPERSING?
 OR SPRAYING?
 L31 0 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L28 AND L29
 L32 2 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L28 AND L30
 L33 34 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L28 OR L31 OR L32
 L34 6 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L33 AND (1840-2004
) /PRY,AY,PY
 L35 0 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L29 AND L19
 L36 74 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L29 AND L7
 L37 41 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L36 AND PROC/RL
 L38 12 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L37 AND (1840-2004
) /PRY,AY,PY
 L39 12 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L38 NOT L34
 L40 12 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L35 OR L39
 L41 18 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L34 OR L40

=> fil wpix

FILE 'WPIX' ENTERED AT 11:59:18 ON 14 JUN 2010

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FILE LAST UPDATED: 9 JUN 2010 <20100609/UP>

MOST RECENT UPDATE: 201036 <201036/DW>

DERWENT WORLD PATENTS INDEX SUBSCRIBER FILE, COVERS 1963 TO DATE

>>> Now containing more than 1.5 million chemical structures in DCR <<<

>>> IPC, ECLA, US National Classifications and Japanese F-Terms
and FI-Terms have been updated with reclassifications to
end of March 2010.

No update date (UP) has been created for the reclassified
documents, but they can be identified by
specific update codes (see HELP CLA for details) <<<

>>> FOR THE LATEST DERWENT WORLD PATENTS INDEX (DWPI)

STN USER DOCUMENTATION, PLEASE VISIT:

http://www.stn-international.com/stn_dwpi.html <<<

>>> HELP for European Patent Classifications see HELP ECLA, HELP ICO <<<

>>> For changes in DWPI see HELP CHANGE - last updated April 6, 2010 <<<

>>> New display format ALLSTR available - see NEWS <<<

>>> US National Patent Classification thesaurus added - see NEWS <<<

=> d que 155

L10 QUE SPE=ON ABB=ON PLU=ON IMPREGNAT? OR PRECIPITAT? OR
SOL GEL? OR CHEMICAL VAPOR DEPOSITION? OR CVD# OR SPUTTE
RING?
L29 QUE SPE=ON ABB=ON PLU=ON (LOADING? OR FEEDING? OR DEL
IVERING? OR SUPPLYING?) (A) CATALYST?
L30 QUE SPE=ON ABB=ON PLU=ON EVAPORATION? OR DISPERSING?
OR SPRAYING?
L42 QUE SPE=ON ABB=ON PLU=ON (BRANCH? OR JUNCTION?) (A) (CA
RBON#) (A) (NANOTUB# OR NANOSTRUCTURE? OR NANOCRYST? OR NAN
OROD? OR NANOCOMPOSIT? OR NANOSCAL? OR NANOPARTICL? OR NA
NO (A) (TUB# OR STRUCTUR? OR CRYST? OR ROD? OR COMPOSIT? OR
SCAL? OR PARTICL?))
L43 0 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L42 AND L29
L44 QUE SPE=ON ABB=ON PLU=ON (CARBON#) (3A) (NANOTUB# OR NA
NOSTRUCTURE? OR NANOCRYST? OR NANOROD? OR NANOCOMPOSIT? O
R NANOSCAL? OR NANOPARTICL? OR NANO (A) (TUB# OR STRUCTUR?
OR CRYST? OR ROD? OR COMPOSIT? OR SCAL? OR PARTICL?))
L45 37 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L44 AND L29
L46 9 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L45 AND (L10 OR L30)
L47 9 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L43 OR L46
L49 QUE SPE=ON ABB=ON PLU=ON ELECTRODE# OR TRANSISTOR? OR
ELECTRONIC? OR NANO ELECTRONIC? OR REINFORCING AGENT? OR
REINFORCING POLYMER? OR ELECTROCHEMICAL PRODUCT?
L50 11 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L45 AND L49
L51 2564 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L44 AND CATALYST?
L52 45 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L51 AND (BRANCH? OR
JUNCTION?)
L53 13 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L52 AND (L10 OR L30)
L54 29 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L47 OR L50 OR L53 OR

L43
 L55 12 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L54 AND (PRY<2005 OR
 PY<2005 OR AY<2005)

=> fil japio

FILE 'JAPIO' ENTERED AT 11:59:24 ON 14 JUN 2010
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FILE LAST UPDATED: 4 JUN 2010 <20100604/UP>
 MOST RECENT PUBLICATION DATE: 25 FEB 2010 <20100225/PD>
 >>> GRAPHIC IMAGES AVAILABLE <<<

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=> d que l56

L10 QUE SPE=ON ABB=ON PLU=ON IMPREGNAT? OR PRECIPITAT? OR
 SOL GEL? OR CHEMICAL VAPOR DEPOSITION? OR CVD# OR SPUTTE
 RING?
 L29 QUE SPE=ON ABB=ON PLU=ON (LOADING? OR FEEDING? OR DEL
 IVERING? OR SUPPLYING?) (A) CATALYST?
 L30 QUE SPE=ON ABB=ON PLU=ON EVAPORATION? OR DISPERSING?
 OR SPRAYING?
 L42 QUE SPE=ON ABB=ON PLU=ON (BRANCH? OR JUNCTION?) (A) (CA
 RBON#) (A) (NANOTUB# OR NANOSTRUCTURE? OR NANOCRYST? OR NAN
 OROD? OR NANOCOMPOSIT? OR NANOSCAL? OR NANOPARTICL? OR NA
 NO(A) (TUB# OR STRUCTUR? OR CRYST? OR ROD? OR COMPOSIT? OR
 SCAL? OR PARTICL?))
 L43 0 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L42 AND L29
 L44 QUE SPE=ON ABB=ON PLU=ON (CARBON#) (3A) (NANOTUB# OR NA
 NOSTRUCTURE? OR NANOCRYST? OR NANOROD? OR NANOCOMPOSIT? O
 R NANOSCAL? OR NANOPARTICL? OR NANO(A) (TUB# OR STRUCTUR?
 OR CRYST? OR ROD? OR COMPOSIT? OR SCAL? OR PARTICL?))
 L45 37 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L44 AND L29
 L46 9 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L45 AND (L10 OR L30)
 L47 9 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L43 OR L46
 L49 QUE SPE=ON ABB=ON PLU=ON ELECTRODE# OR TRANSISTOR? OR
 ELECTRONIC? OR NANOELECTRONIC? OR REINFORCING AGENT? OR
 REINFORCING POLYMER? OR ELECTROCHEMICAL PRODUCT?
 L50 11 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L45 AND L49
 L51 2564 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L44 AND CATALYST?
 L52 45 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L51 AND (BRANCH? OR
 JUNCTION?)
 L53 13 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L52 AND (L10 OR L30)
 L54 29 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L47 OR L50 OR L53 OR
 L43
 L56 0 SEA FILE=JAPIO SPE=ON ABB=ON PLU=ON L54 AND (PRY<2005
 OR PY<2005 OR AY<2005)

=> fil pascal

FILE 'PASCAL' ENTERED AT 11:59:33 ON 14 JUN 2010
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FILE COVERS 1977 TO DATE.

<20100614/UP>

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=> d que 157

L10 QUE SPE=ON ABB=ON PLU=ON IMPREGNAT? OR PRECIPITAT? OR
SOL GEL? OR CHEMICAL VAPOR DEPOSITION? OR CVD# OR SPUTTE
RING?
L29 QUE SPE=ON ABB=ON PLU=ON (LOADING? OR FEEDING? OR DEL
IVERING? OR SUPPLYING?) (A) CATALYST?
L30 QUE SPE=ON ABB=ON PLU=ON EVAPORATION? OR DISPERSING?
OR SPRAYING?
L42 QUE SPE=ON ABB=ON PLU=ON (BRANCH? OR JUNCTION?) (A) (CA
RBON#) (A) (NANOTUB# OR NANOSTRUCTURE? OR NANOCRYST? OR NAN
OROD? OR NANOCOMPOSIT? OR NANOSCAL? OR NANOPARTICL? OR NA
NO(A) (TUB# OR STRUCTUR? OR CRYST? OR ROD? OR COMPOSIT? OR
SCAL? OR PARTICL?))
L43 0 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L42 AND L29
L44 QUE SPE=ON ABB=ON PLU=ON (CARBON#) (3A) (NANOTUB# OR NA
NOSTRUCTURE? OR NANOCRYST? OR NANOROD? OR NANOCOMPOSIT? O
R NANOSCAL? OR NANOPARTICL? OR NANO(A) (TUB# OR STRUCTUR?
OR CRYST? OR ROD? OR COMPOSIT? OR SCAL? OR PARTICL?))
L45 37 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L44 AND L29
L46 9 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L45 AND (L10 OR L30)
L47 9 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L43 OR L46
L49 QUE SPE=ON ABB=ON PLU=ON ELECTRODE# OR TRANSISTOR? OR
ELECTRONIC? OR NANO ELECTRONIC? OR REINFORCING AGENT? OR
REINFORCING POLYMER? OR ELECTROCHEMICAL PRODUCT?
L50 11 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L45 AND L49
L51 2564 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L44 AND CATALYST?
L52 45 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L51 AND (BRANCH? OR
JUNCTION?)
L53 13 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L52 AND (L10 OR L30)
L54 29 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L47 OR L50 OR L53 OR
L43
L57 4 SEA FILE=PASCAL SPE=ON ABB=ON PLU=ON L54 AND (PRY<2005
OR PY<2005 OR AY<2005)

=> fil compendex

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<20100614/UP>

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=> d que 158

L10 QUE SPE=ON ABB=ON PLU=ON IMPREGNAT? OR PRECIPITAT? OR

SOL GEL? OR CHEMICAL VAPOR DEPOSITION? OR CVD# OR SPUTTE RING?

L29 QUE SPE=ON ABB=ON PLU=ON (LOADING? OR FEEDING? OR DEL IVERING? OR SUPPLYING?) (A) CATALYST?

L30 QUE SPE=ON ABB=ON PLU=ON EVAPORATION? OR DISPERSING? OR SPRAYING?

L42 QUE SPE=ON ABB=ON PLU=ON (BRANCH? OR JUNCTION?) (A) (CA RBON#) (A) (NANOTUB# OR NANOSTRUCTURE? OR NANOCRYST? OR NAN OROD? OR NANOCOMPOSIT? OR NANOSCAL? OR NANOPARTICL? OR NA NO(A) (TUB# OR STRUCTUR? OR CRYST? OR ROD? OR COMPOSIT? OR SCAL? OR PARTICL?))

L43 0 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L42 AND L29

L44 QUE SPE=ON ABB=ON PLU=ON (CARBON#) (3A) (NANOTUB# OR NA NOSTRUCTURE? OR NANOCRYST? OR NANOROD? OR NANOCOMPOSIT? O R NANOSCAL? OR NANOPARTICL? OR NANO(A) (TUB# OR STRUCTUR? OR CRYST? OR ROD? OR COMPOSIT? OR SCAL? OR PARTICL?))

L45 37 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L44 AND L29

L46 9 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L45 AND (L10 OR L30)

L47 9 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L43 OR L46

L49 QUE SPE=ON ABB=ON PLU=ON ELECTRODE# OR TRANSISTOR? OR ELECTRONIC? OR NANO ELECTRONIC? OR REINFORCING AGENT? OR REINFORCING POLYMER? OR ELECTROCHEMICAL PRODUCT?

L50 11 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L45 AND L49

L51 2564 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L44 AND CATALYST?

L52 45 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L51 AND (BRANCH? OR JUNCTION?)

L53 13 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L52 AND (L10 OR L30)

L54 29 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L47 OR L50 OR L53 OR L43

L58 7 SEA FILE=COMPENDEX SPE=ON ABB=ON PLU=ON L54 AND (PRI<2005 OR PY<2005 OR AY<2005)

=> fil dissabs

FILE 'DISSABS' ENTERED AT 11:59:51 ON 14 JUN 2010

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=> d que 159

L10 QUE SPE=ON ABB=ON PLU=ON IMPREGNAT? OR PRECIPITAT? OR SOL GEL? OR CHEMICAL VAPOR DEPOSITION? OR CVD# OR SPUTTE RING?

L29 QUE SPE=ON ABB=ON PLU=ON (LOADING? OR FEEDING? OR DEL IVERING? OR SUPPLYING?) (A) CATALYST?

L30 QUE SPE=ON ABB=ON PLU=ON EVAPORATION? OR DISPERSING? OR SPRAYING?

L42 QUE SPE=ON ABB=ON PLU=ON (BRANCH? OR JUNCTION?) (A) (CA

RBON#) (A) (NANOTUB# OR NANOSTRUCTURE? OR NANOCRYST? OR NANOROD? OR NANOCOMPOSIT? OR NANOSCAL? OR NANOPARTICL? OR NANO(A) (TUB# OR STRUCTUR? OR CRYST? OR ROD? OR COMPOSIT? OR SCAL? OR PARTICL?))

L43 0 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L42 AND L29

L44 QUE SPE=ON ABB=ON PLU=ON (CARBON#) (3A) (NANOTUB# OR NANOSTRUCTURE? OR NANOCRYST? OR NANOROD? OR NANOCOMPOSIT? OR NANOSCAL? OR NANOPARTICL? OR NANO(A) (TUB# OR STRUCTUR? OR CRYST? OR ROD? OR COMPOSIT? OR SCAL? OR PARTICL?))

L45 37 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L44 AND L29

L46 9 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L45 AND (L10 OR L30)

L47 9 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L43 OR L46

L49 QUE SPE=ON ABB=ON PLU=ON ELECTRODE# OR TRANSISTOR? OR ELECTRONIC? OR NANO ELECTRONIC? OR REINFORCING AGENT? OR REINFORCING POLYMER? OR ELECTROCHEMICAL PRODUCT?

L50 11 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L45 AND L49

L51 2564 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L44 AND CATALYST?

L52 45 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L51 AND (BRANCH? OR JUNCTION?)

L53 13 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L52 AND (L10 OR L30)

L54 29 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L47 OR L50 OR L53 OR L43

L59 0 SEA FILE=DISSABS SPE=ON ABB=ON PLU=ON L54 AND (PRY<2005 OR PY<2005 OR AY<2005)

=> fil confsci

FILE 'CONFSCI' ENTERED AT 12:00:23 ON 14 JUN 2010

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FILE COVERS 1973 TO 21 May 2010 (20100521/ED)

CSA has resumed updates, see NEWS FILE

=> d que 160

L10 QUE SPE=ON ABB=ON PLU=ON IMPREGNAT? OR PRECIPITAT? OR SOL GEL? OR CHEMICAL VAPOR DEPOSITION? OR CVD# OR SPUTTE RING?

L29 QUE SPE=ON ABB=ON PLU=ON (LOADING? OR FEEDING? OR DEL IVERING? OR SUPPLYING?) (A) CATALYST?

L30 QUE SPE=ON ABB=ON PLU=ON EVAPORATION? OR DISPERSING? OR SPRAYING?

L42 QUE SPE=ON ABB=ON PLU=ON (BRANCH? OR JUNCTION?) (A) (CARBON#) (A) (NANOTUB# OR NANOSTRUCTURE? OR NANOCRYST? OR NANOROD? OR NANOCOMPOSIT? OR NANOSCAL? OR NANOPARTICL? OR NANO(A) (TUB# OR STRUCTUR? OR CRYST? OR ROD? OR COMPOSIT? OR SCAL? OR PARTICL?))

L43 0 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L42 AND L29

L44 QUE SPE=ON ABB=ON PLU=ON (CARBON#) (3A) (NANOTUB# OR NANOSTRUCTURE? OR NANOCRYST? OR NANOROD? OR NANOCOMPOSIT? OR NANOSCAL? OR NANOPARTICL? OR NANO(A) (TUB# OR STRUCTUR? OR CRYST? OR ROD? OR COMPOSIT? OR SCAL? OR PARTICL?))

L45 37 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L44 AND L29

L46 9 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L45 AND (L10 OR L30)

L47 9 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L43 OR L46

L49 QUE SPE=ON ABB=ON PLU=ON ELECTRODE# OR TRANSISTOR? OR
ELECTRONIC? OR NANOELECTRONIC? OR REINFORCING AGENT? OR
REINFORCING POLYMER? OR ELECTROCHEMICAL PRODUCT?
L50 11 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L45 AND L49
L51 2564 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L44 AND CATALYST?
L52 45 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L51 AND (BRANCH? OR
JUNCTION?)
L53 13 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L52 AND (L10 OR L30)
L54 29 SEA FILE=WPIX SPE=ON ABB=ON PLU=ON L47 OR L50 OR L53 OR
L43
L60 0 SEA FILE=CONFSCI SPE=ON ABB=ON PLU=ON L54 AND (PRY<2005
OR PY<2005 OR AY<2005)

=> dup rem l41 l55 l56 l57 l58 l59 l60

L56 HAS NO ANSWERS

L59 HAS NO ANSWERS

L60 HAS NO ANSWERS

FILE 'HCAPLUS' ENTERED AT 12:00:41 ON 14 JUN 2010

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FILE 'COMPENDEX' ENTERED AT 12:00:41 ON 14 JUN 2010

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PROCESSING COMPLETED FOR L41

PROCESSING COMPLETED FOR L55

PROCESSING COMPLETED FOR L56

PROCESSING COMPLETED FOR L57

PROCESSING COMPLETED FOR L58

PROCESSING COMPLETED FOR L59

PROCESSING COMPLETED FOR L60

L61 38 DUP REM L41 L55 L56 L57 L58 L59 L60 (3 DUPLICATES REMOVED)

ANSWERS '1-18' FROM FILE HCAPLUS

ANSWERS '19-29' FROM FILE WPIX

ANSWERS '30-33' FROM FILE PASCAL

ANSWERS '34-38' FROM FILE COMPENDEX

=> d l-18 ibib ed abs hitstr hitind

L61 ANSWER 1 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN DUPLICATE 1

ACCESSION NUMBER: 2006:745370 HCAPLUS Full-text

DOCUMENT NUMBER: 145:276404

TITLE: Method for manufacturing open-structure
carbon nanotube field emitter by
using plasma enhanced chemical vapor deposition

INVENTOR(S): Kim, Gwang Sik; Ryu, Ho Jin
 PATENT ASSIGNEE(S): Korea Research Institute of Chemical Technology,
 S. Korea
 SOURCE: Repub. Korean Kongkae Taeho Kongbo, No pp. given
 CODEN: KRXXA7
 DOCUMENT TYPE: Patent
 LANGUAGE: Korean
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
KR 2004060253	A	20040706	KR 2002-86799	20021230
			<--	
PRIORITY APPLN. INFO.:			KR 2002-86799	20021230
			<--	

ED Entered STN: 31 Jul 2006

AB A method is provided to effectively manufacture field emitters with controlled lengths and diams. by removing the metal tips from ends of carbon nanotubes through an etching process. A method comprises a step of uniformly supplying raw gas for forming a thin film on the substrate disposed in a chamber; a step of heating the reaction chamber to the temperature of 500 to 580° to thermally decompose the raw gas; a step of supplying catalyst gas in such a manner that the flow rate between the raw gas and the catalyst gas ranges from 1:3 to 1:7; a step of applying high frequency power of 100 to 200W into the chamber, and applying DC bias power to the rear surface of the substrate, to thereby permit the raw gas and the catalyst gas to have plasma state; and a step of depositing and permitting the plasma state raw gas to grow on the substrate to thereby vertically orient a carbon nanotube thin film on the substrate.

IT 7440-44-0, Carbon, processes
 (nanotube; manufacturing open structure carbon
 nanotube field emitter by using plasma enhanced chemical vapor
 deposition)

RN 7440-44-0 HCAPLUS

CN Carbon (CA INDEX NAME)

c

IC ICM H01J001-30

CC 57-8 (Ceramics)

Section cross-reference(s): 76

ST carbon nanotube field emitter plasma vapor
 deposition

IT Nanotubes

(carbon; manufacturing open structure carbon nanotube

field emitter by using plasma enhanced chemical vapor deposition)

IT Field emission cathodes

Field emitters

Plasma

(manufacturing open structure carbon nanotube field

emitter by using plasma enhanced chemical vapor deposition)

IT Vapor deposition process

(plasma; manufacturing open structure carbon nanotube

field emitter by using plasma enhanced chemical vapor deposition)

IT 7440-44-0, Carbon, processes

(nanotube; manufacturing open structure carbon

nanotube field emitter by using plasma enhanced chemical vapor deposition)

L61 ANSWER 2 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN
 ACCESSION NUMBER: 2006:122725 HCAPLUS Full-text
 DOCUMENT NUMBER: 144:181274
 TITLE: Carbon nanotube devices and
 their manufacture while suppressing agglomeration
 or fusion of catalysts
 INVENTOR(S): Noda, Masaru; Maruyama, Shigeo
 PATENT ASSIGNEE(S): The Society of Chemical Engineers, Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 13 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	---	-----	-----	-----
JP 2006035379	A	20060209	JP 2004-219370	20040727
			<--	
PRIORITY APPLN. INFO.:			JP 2004-219370	20040727
			<--	

ED Entered STN: 10 Feb 2006

AB Claimed here are devices holding patterned carbon nanotubes wherein numerical d. of the nanotubes is continuously changed along with the distance from the sp. position on substrates. Also claimed is a process called "combinatorial masked deposition (CMD)" for the devices, having the steps below; arranging deposition masks above substrates (S) with certain gap, feeding catalysts to S through the masks, and feeding carbon sources to S. The masks may possess plural holes of different dimension. Carbon nanotube patterns with desired degree of interlacing or thickness as long as optimum numerical d. can be formed as above.

CC 75-1 (Crystallography and Liquid Crystals)

Section cross-reference(s): 76

ST combinatorial masked deposition carbon nanotube
 device; mask hole pattern combinatorial sputtering carbon
 nanotube; numerical density control carbon
 nanotube CVD

IT Nanotubes

(carbon; carbon nanotube devices
 having desired numerical d. by combinatorial masked deposition)

IT Vapor deposition process

(chemical; carbon nanotube devices having desired
 numerical d. by combinatorial masked deposition)

IT 7440-48-4, Cobalt, uses

(carbon nanotube devices having desired
 numerical d. by combinatorial masked deposition)

IT 64-17-5, Ethanol, processes

(carbon sources; carbon nanotube
 devices having desired numerical d. by combinatorial masked
 deposition)

IT 7440-44-0P, Carbon, processes

(nanotubes; carbon nanotube devices having
 desired numerical d. by combinatorial masked deposition)

IT 7440-21-3, Silicon, processes

(substrates; carbon nanotube devices having
 desired numerical d. by combinatorial masked deposition)

L61 ANSWER 3 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN
 ACCESSION NUMBER: 2005:811698 HCAPLUS Full-text
 DOCUMENT NUMBER: 143:220676
 TITLE: A method for the preparation of y-branched carbon nanotubes
 INVENTOR(S): Kim, Young Nam
 PATENT ASSIGNEE(S): KH Chemicals Co., Ltd., S. Korea
 SOURCE: PCT Int. Appl., 32 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2005075340	A1	20050818	WO 2005-KR337	20050204
<--				
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
KR 2005080341	A	20050812	KR 2004-8417	20040209
<--				
EP 1720796	A1	20061115	EP 2005-726365	20050204
<--				
R: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LI, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR				
CN 1918067	A	20070221	CN 2005-80004338	20050204
<--				
JP 2007528339	T	20071011	JP 2006-552051	20050204
<--				
US 20070224104	A1	20070927	US 2007-587625	20070524
<--				
PRIORITY APPLN. INFO.:			KR 2004-8417	A 20040209
			<--	
			WO 2005-KR337	W 20050204

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

ED Entered STN: 18 Aug 2005

AB The present invention provides a process for preparing Y-branched C nanotubes and the product thereby, Y-branched C nanotubes. More specifically, the present invention provides a process for preparing Y-branched C nanotubes, comprising: loading a catalyst on a C nanotube carrier; pre-treating the catalyst-loaded C nanotubes to have the catalyst bonded tightly to the surface of C nanotubes; and performing a synthetic reaction of C nanotubes using the obtained catalyst-loaded C nanotubes. According to the process of the present invention, Y-branched C nanotubes having at least one or more Y-junctions in various shapes can be prepared easily, simply and in bulk by using the conventional facilities under the usual condition of process. Thus, the invention is promising industrially. The Y-branched C nanotubes of the

invention hold great potential in regard of materials for electrodes,
reinforcing agents for polymers, transistors and electrochem. products.

IC ICM B82B003-00

CC 76-14 (Electric Phenomena)

Section cross-reference(s): 48

ST Y branched carbon nanotube fabrication
catalyst

IT Catalysts
Reduction
Transistors
(preparation of y-branched carbon nanotubes)

IT Alloys, uses
Borides
Bromides, uses
Fluorides, uses
Metals, uses
Nitrides
Oxides (inorganic), uses
Sulfides, uses
Transition metal complexes
(preparation of y-branched carbon nanotubes)

OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS
RECORD (1 CITINGS)

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR
THIS RECORD. ALL CITATIONS AVAILABLE IN THE
RE FORMAT

L61 ANSWER 4 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 2004:739359 HCAPLUS Full-text

DOCUMENT NUMBER: 141:246070

TITLE: Method for loading catalyst on
fibrous carbon and fuel cell electrodes and fuel
cells using the fibers

INVENTOR(S): Nakamura, Junji; Komatsu, Toshiki; Nakano, Miharuru;
Arai, Kazuya; Ota, Keishin; Shimizu, Harukazu;
Takasawa, Yosuke

PATENT ASSIGNEE(S): Sekisui Chemical Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 14 pp.
CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2004253224	A	20040909	JP 2003-41565	20030219
			<--	
PRIORITY APPLN. INFO.:			JP 2003-41565	20030219
			<--	

ED Entered STN: 10 Sep 2004

AB Catalyst particles are loaded on fibrous carbon, e.g., carbon nanotubes, by
treating the carbon with an oxidant to form reactive sites on the carbon, and
loading the catalyst at the reactive sites. The oxidant is selected from HNO₃,
H₂SO₄, H₂O₂, O₃, O₂, NaClO, and (NH₄)₂S₂O₈; and the catalyst is Pt.

IC ICM H01M004-88

ICS H01M004-96; B01J023-42; B01J032-00; B01J037-02; H01M008-10

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST fuel cell electrode carbon nanotube oxidant
platinum catalyst loading

L61 ANSWER 5 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN
 ACCESSION NUMBER: 2004:1052077 HCAPLUS Full-text
 DOCUMENT NUMBER: 142:142994
 TITLE: Synthesis and Electrochemical Characterization of
 Uniformly-Dispersed High Loading Pt
 Nanoparticles on Sonochemically-Treated
 Carbon Nanotubes
 AUTHOR(S): Xing, Yangchuan
 CORPORATE SOURCE: Department of Chemical Biological Engineering,
 University of Missouri Rolla, Rolla, MO, 65409,
 USA
 SOURCE: Journal of Physical Chemistry B (2004),
 108(50), 19255-19259
 CODEN: JPCBFK; ISSN: 1520-6106
 PUBLISHER: American Chemical Society
 DOCUMENT TYPE: Journal
 LANGUAGE: English
 ED Entered STN: 09 Dec 2004

- AB A sonochem. process was developed to treat C nanotubes in nitric and sulfuric acids to create surface functional groups for metal nanoparticle deposition. C nanotubes treated in the sonochem. process lead to the deposition of uniformly dispersed high loading Pt nanoparticles, which were not achieved with C nanotubes treated in reflux processes. Pt nanoparticles of a size <5 nm and loading up to 30% with little aggregation were synthesized on the sonochem. treated C nanotubes. Cyclic voltammetry measurements in 1.0M H2SO4 showed that the Pt nanoparticles on C nanotubes are >100% active in the electrochem. adsorption and desorption of hydrogen than the Pt nanoparticles supported on C black. This enhancement of electrochem. activity is attributed to the unique structures of C nanotubes and the interactions between the Pt nanoparticles and the C nanotube support. The ability to synthesize high loading Pt on C nanotubes using the sonochem. technique makes it possible to prepare high loading catalysts for the cathode of polymer electrolyte membrane (PEM) fuel cells.
- CC 72-2 (Electrochemistry)
 Section cross-reference(s): 52, 66
- ST electrochem characterization dispersed platinum nanoparticle
 sonochem treated carbon nanotube; cyclic
 voltammetry platinum nanoparticle carbon
 nanotube electroadsorption desorption hydrogen; nitric
 sulfuric acid sonochem treatment carbon nanotube
 platinum nanoparticle
- IT Fuel cell cathodes
 (Pt nanoparticles on carbon nanotubes)
- IT Nanotubes
 (carbon; sonochem. treatment in nitric and sulfuric acids and
 electrochem. characterization of uniformly-dispersed high loading
 Pt nanoparticles on sonochem. treated carbon
 nanotubes)
- IT Nanoparticles
 (electrochem. characterization of uniformly-dispersed high loading
 Pt nanoparticles on sonochem. treated carbon
 multiwalled nanotubes)
- IT Adsorption
 Desorption
 (electrochem.; of hydrogen by Pt nanoparticles on
 carbon nanotubes)
- IT Particle size
 (nanoscale; of Pt nanoparticles on sonochem. treated
 carbon nanotubes)

- IT Cyclic voltammetry
(of Pt nanoparticles on carbon nanotubes in sulfuric acid solution)
- IT Sound and Ultrasound
(sonochem. treatment of carbon multiwalled nanotubes in nitric and sulfuric acids and electrochem. characterization of uniformly-dispersed high loading Pt nanoparticles on sonochem. treated carbon nanotubes)
- IT 1333-74-0, Hydrogen, processes
(electrochem. adsorption and desorption by Pt nanoparticles on carbon nanotubes)
- IT 7440-06-4, Platinum, properties
(electrochem. characterization of uniformly-dispersed high loading Pt nanoparticles on sonochem. treated carbon multiwalled nanotubes)
- IT 7440-44-0, Carbon, properties
(nanotubes; sonochem. treatment in nitric and sulfuric acids and electrochem. characterization of uniformly-dispersed high loading Pt nanoparticles on sonochem. treated carbon nanotubes)
- IT 7697-37-2, Nitric acid, uses
(sonochem. treatment of carbon nanotubes in nitric and sulfuric acids and electrochem. characterization of uniformly-dispersed high loading Pt nanoparticles on sonochem. treated carbon nanotubes)
- IT 7664-93-9, Sulfuric acid, uses
(sonochem. treatment of carbon nanotubes in nitric and sulfuric acids and electrochem. characterization of uniformly-dispersed high loading Pt nanoparticles on sonochem. treated carbon nanotubes)

OS.CITING REF COUNT: 193 THERE ARE 193 CAPLUS RECORDS THAT CITE THIS RECORD (195 CITINGS)

REFERENCE COUNT: 30 THERE ARE 30 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L61 ANSWER 6 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 2004:999741 HCAPLUS Full-text

DOCUMENT NUMBER: 142:137640

TITLE: Growth of Single-Walled Carbon Nanotubes by the Rapid Heating of a Supported Catalyst

AUTHOR(S): Li, Ya-Li; Kinloch, Ian A.; Shaffer, Milo S. P.; Singh, Charanjeet; Geng, Junfeng; Johnson, Brian F. G.; Windle, Alan H.

CORPORATE SOURCE: Department of Materials Science and Metallurgy, University of Cambridge, Cambridge, CB2 3QZ, UK

SOURCE: Chemistry of Materials (2004), 16(26), 5637-5643

CODEN: CMATEX; ISSN: 0897-4756

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

ED Entered STN: 21 Nov 2004

AB Single-walled carbon nanotubes (SWNTs) were synthesized by the rapid injection of a nickel formate catalyst/silica gel support into a hot fluidized-bed reactor. The initial rapid heating of the catalyst in the hydrocarbon feedstock was essential for the nucleation of SWNTs since only amorphous or graphitic carbon particles were formed without it. This suggested that the rapid heating of the catalyst precursor resulted in the formation of the small metal particles required for SWNT growth, probably due to the accelerated

thermal decomposition of the catalyst precursor and enhanced nucleation rate. The growth of the SWNTs was investigated by adopting different methods for introducing the catalyst, and by varying the synthesis parameters, including the catalyst loading, hydrocarbon gas flow rate, and concentration. SWNTs formed only under certain reaction conditions. The nanotubes produced were characterized by electron microscopy and Raman spectroscopy.

CC 49-1 (Industrial Inorganic Chemicals)
 ST single walled carbon nanotube fluidized bed reactor; nucleation condensation carbon nanotube formation nickel catalyst; silica gel nickel catalyst carbon nanotube manuf
 IT Reactors
 (fluidized-bed, carbon nanotube formation in; nucleation and growth of single-walled carbon nanotubes by rapid heating of silica gel-supported nickel formate catalyst)
 IT Fluidized beds
 (reactors, carbon nanotube formation in; nucleation and growth of single-walled carbon nanotubes by rapid heating of silica gel-supported nickel formate catalyst)
 OS.CITING REF COUNT: 12 THERE ARE 12 CAPLUS RECORDS THAT CITE THIS RECORD (12 CITINGS)
 REFERENCE COUNT: 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L61 ANSWER 7 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 2004:839085 HCAPLUS Full-text

DOCUMENT NUMBER: 142:10056

TITLE: Preparation of a new carbon nano-particle by arc discharge

AUTHOR(S): Li, Bean-Jon; Kung, Sheng-Chin; Hsu, Chih-Ming; Gao, Jhy-Yeong; Lai, Hong-Jen

CORPORATE SOURCE: Materials Research Laboratories, Industrial Technology Research Institute, Hsinchu, Taiwan

SOURCE: Materials Research Society Symposium Proceedings (2004), 822(Nanostructured Materials in Alternative Energy Devices), 115-120
 CODEN: MRSPDH; ISSN: 0272-9172

PUBLISHER: Materials Research Society

DOCUMENT TYPE: Journal

LANGUAGE: English

ED Entered STN: 14 Oct 2004

AB Synthesis and characterization of a new carbon particle are investigated in this study. The carbon particle, which possesses a high surface area (682 cm²/g), is suitable for catalysts loading in application of fuel cell. As well known, carbon materials are used to be a support of Pt catalyst to achieve high dispersion to enhance the activity of Pt. The synthesis was performed by conventional arc discharge process between two graphite electrodes in vacuum. A high-current range from 100.apprx. 300 A was utilized to evaporate the cathode electrode to produce carbon soot onto the wall of chamber, and further high production rate of 10 g/h was achieved. The morphol. and microstructure of the materials were investigated by SEM, HRTEM, x-ray diffraction and Raman spectroscopy. Observations of the soot by SEM and HRTEM have shown that it consists agglomerations of carbon particles linked each other to form a chain-like structure. Most carbon particles are approx. 30 .apprx. 60 nm in diameter. HRTEM observation reveals that a carbon particle is comprised of several defective onions with different diams. and extremely curled graphene sheets, which appear as double-sheet layers.

CC 57-8 (Ceramics)

Section cross-reference(s): 52, 76

ST carbon nanoparticle arc discharge microstructure
morphol

IT Soot
(carbon; preparation of carbon nano-
particle by arc discharge)

IT Electric discharge
Microstructure
Nanoparticles
Surface area
Surface structure
(preparation of carbon nano-particle by
arc discharge)

IT 7440-44-0, Carbon, processes
(preparation of carbon nano-particle by
arc discharge)

REFERENCE COUNT: 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR
THIS RECORD. ALL CITATIONS AVAILABLE IN THE
RE FORMAT

L61 ANSWER 8 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN
ACCESSION NUMBER: 2004:954536 HCAPLUS Full-text
DOCUMENT NUMBER: 142:282267
TITLE: A low cost method for the synthesis of carbon
nanotubes and highly Y-branched nanotubes
AUTHOR(S): Heyning, O. T.; Kouwenhoven, L.; Bernier, P.;
Glerup, M.
CORPORATE SOURCE: GDPC(UMR5581), Universite Montpellier II,
Montpellier, 34095/5, Fr.
SOURCE: AIP Conference Proceedings (2004),
723(Electronic Properties of Synthetic
Nanostructures), 45-48
CODEN: APCPCS; ISSN: 0094-243X
PUBLISHER: American Institute of Physics
DOCUMENT TYPE: Journal
LANGUAGE: English
ED Entered STN: 10 Nov 2004

AB Using a novel simplified low cost set-up in a CVD type of process using the
aerosol technique, carbon nanotubes and branched nanotube trees have been
synthesized. In this set-up a catalyst precursor solution of metal-salts
dissolved in water is sprayed into a furnace as aerosols. In the furnace a
mixture of carbon reactant gas and hydrogen forms a heated atmospheric In
this atmospheric the active catalyst particles are formed and reduced in-situ
and the growth of the nanotubes occurs. Controlled by a number of parameters,
the active catalyst particles induce the growth of carbon nanotubes and highly
Y-branched nanotubes.

CC 49-1 (Industrial Inorganic Chemicals)

ST carbon nanotube Y branched
nanotube synthesis; nanotube Y branched synthesis

OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS
RECORD (1 CITINGS)

REFERENCE COUNT: 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR
THIS RECORD. ALL CITATIONS AVAILABLE IN THE
RE FORMAT

L61 ANSWER 9 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN
ACCESSION NUMBER: 2003:492454 HCAPLUS Full-text
DOCUMENT NUMBER: 139:54874
TITLE: Method for fabrication of carbon nanotubes having
multiple junctions
INVENTOR(S): Ting, Jyh-Ming; Chang, Chi-Chih

PATENT ASSIGNEE(S): Taiwan
 SOURCE: U.S. Pat. Appl. Publ., 7 pp.
 CODEN: USXXCO
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20030118727	A1	20030626	US 2002-292552	20021112
			<--	
TW 552156	B	20030911	TW 2001-90132118	20011225
			<--	
PRIORITY APPLN. INFO.:			TW 2001-90132118	A 20011225
			<--	

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

ED Entered STN: 29 Jun 2003

AB This invention describes a method for fabricating C nanotubes having multiple junctions, comprising the process of supplying at least a substrate, metal powders, and C-containing reactant gas to CVD system under high temperature C nanotubes having multiple junctions form above the substrate, thereby exhibiting 2-dimensional and/or 3-dimensional web-like structures with uniform diams.

IC ICM C23C016-26

INCL 427249100

CC 49-1 (Industrial Inorganic Chemicals)

Section cross-reference(s): 75

ST multiple junction carbon nanotube
 fabrication CVD

IT Nanotubes

(carbon; thermal CVD method for fabrication of carbon
 nanotubes having multiple junctions)

IT Vapor deposition process

(chemical; thermal CVD method for fabrication of carbon
 nanotubes having multiple junctions)

IT Hydrocarbons, processes

(precursor; thermal CVD method for fabrication of carbon
 nanotubes having multiple junctions)

IT Cobalt alloy, base

Iron alloy, base

Nickel alloy, base

Palladium alloy, base

Platinum alloy, base

(thermal CVD method for fabrication of carbon nanotubes
 having multiple junctions)

IT 74-82-8, Methane, processes 74-85-1, Ethylene, processes 74-86-2,

Acetylene, processes 74-98-6, Propane, processes

(precursor; thermal CVD method for fabrication of carbon
 nanotubes having multiple junctions)

IT 7440-21-3, Silicon, uses

(substrate; thermal CVD method for fabrication of carbon
 nanotubes having multiple junctions)

IT 7439-89-6, Iron, uses 7440-02-0, Nickel, uses 7440-05-3,

Palladium, uses 7440-06-4, Platinum, uses 7440-48-4, Cobalt, uses

(thermal CVD method for fabrication of carbon nanotubes
 having multiple junctions)

OS.CITING REF COUNT: 6 THERE ARE 6 CAPLUS RECORDS THAT CITE THIS
 RECORD (6 CITINGS)

L61 ANSWER 10 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 2003:257584 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 138:257962

TITLE: System for storage of hydrogen by reversible hydrogenation of aromatic compounds

INVENTOR(S): Ichikawa, Masaru; Kariya, Nobuko; Tsuchiyama, Kazuo; Fukaya, Kazuhiro; Goto, Yasushi

PATENT ASSIGNEE(S): Sekisui Chemical Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 13 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
JP 2003095603	A	20030403	JP 2001-294553	20010926
			<--	
PRIORITY APPLN. INFO.:			JP 2001-294553	20010926
			<--	

ED Entered STN: 03 Apr 2003

AB The system comprises (A) a means for storage of H-absorbed materials and/or H supplier, (B) a reactor equipped with a nozzle, for jetting the materials in A, a heater, and a metal-supporting catalyst, (C) a means for feeding materials from A to B, (D) a means for separation of H by condensation, and (E) a means for recovering the materials separated in process D. In the said system, the reactor is also equipped with a means for feeding catalyst activators onto the metal-supporting catalyst surface. The system is suitable for use in fuel cell systems for domestic use.

IT 7440-44-0, Carbon, uses

(activated, nanotube, support; storage of hydrogen for fuel cell systems in aromatic compds. by reversible hydrogenation-dehydrogenation)

RN 7440-44-0 HCAPLUS

CN Carbon (CA INDEX NAME)

c

IC ICM C01B003-00

ICS C07C005-10; C07C005-367; C07C013-18; C07C013-50; C07C015-04; C07C015-24; H01M008-00; H01M008-06; C07B061-00

CC 52-3 (Electrochemical, Radiational, and Thermal Energy Technology) Section cross-reference(s): 24, 25

IT 7440-44-0, Carbon, uses

(activated, nanotube, support; storage of hydrogen for fuel cell systems in aromatic compds. by reversible hydrogenation-dehydrogenation)

OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)

L61 ANSWER 11 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 2005:1071520 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 143:349466

TITLE: Metal oxide catalyst and process for preparation of bunched multiwall carbon nanotubes

INVENTOR(S): Li, Yu; Zhang, Xiaobin; Chen, Fei; Tao, Xinyong;
Kong, Fanzhi; Yang, Xiaofang; Cheng, Jipeng; Xu,
Junming; Huang, Wanzhen; Shen, Lihua; Ding,
Zhipeng; Liu, Fu; Zhang, Wenkui; Tu, Jiangping
PATENT ASSIGNEE(S): Zhejiang University, Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 6 pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
CN 1443709	A	20030924	CN 2003-116522	20030417
			<--	
CN 1217737	C	20050907		
PRIORITY APPLN. INFO.:			CN 2003-116522	20030417
			<--	

ED Entered STN: 07 Oct 2005

AB The catalyst contains oxides of Mg and Mo at a molar ratio of Mg/Mo 0.5-2.0:0.5-3.0. The Mg may be from MgO, Mg(NO₃)₂·6H₂O, magnesium acetate, MgCl₂·6H₂O, MgSO₄·7H₂O; the Mo from molybdate or Mo oxides. The process comprises loading catalyst in fixed-bed gas-continuous current reactor, introducing methane and H₂/N₂/inert gas with flow rates of 50-1500 sccm and 50-300 sccm resp., allowing to react at 750-1200° for 10-100 min, and collecting product. The process is simple and high in yield, and the C nanotubes have even diameter and high purity.

IC ICM C01B031-02

ICS B01J023-28

CC 49-1 (Industrial Inorganic Chemicals)

Section cross-reference(s): 67

ST metal oxide catalyst carbon nanotube prepn

L61 ANSWER 12 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 2005:1071519 HCAPLUS Full-text

DOCUMENT NUMBER: 143:349465

TITLE: Metal oxide catalyst and process for preparation of bunched multiwall carbon nanotubes

INVENTOR(S): Li, Yu; Zhang, Xiaobin; Tao, Xinyong; Liu, Fu;

Zhang, Wenkui; Tu, Jiangping

PATENT ASSIGNEE(S): Zhejiang University, Peop. Rep. China

SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 6 pp.

CODEN: CNXXEV

DOCUMENT TYPE: Patent

LANGUAGE: Chinese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
CN 1443708	A	20030924	CN 2003-116514	20030417
			<--	
CN 1226085	C	20051109		
PRIORITY APPLN. INFO.:			CN 2003-116514	20030417
			<--	

ED Entered STN: 07 Oct 2005

AB The title catalyst is Fe/Mo/MgO and Ni/Mo/MgO catalyst, and has oxides of Mg and Mo as primary catalyst and Fe and Ni as promoter; and the molar ratio of Fe or Ni:Mo:Mg is 0.1-1.0:0.5-2:0.8-3. The Mg may be from Mg(NO₃)₂·6H₂O,

magnesium acetate, $\text{MgCl}_2 \cdot 6\text{H}_2\text{O}$, $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$; the Mo from molybdate or Mo oxides; the Fe from $\text{Fe}(\text{NO}_3)_3 \cdot 9\text{H}_2\text{O}$, ferric acetate, FeCl_3 , $\text{Fe}_2(\text{SO}_4)_3$; and Ni from $\text{Ni}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$, nickel acetate, $\text{NiCl}_2 \cdot 6\text{H}_2\text{O}$, and NiSO_4 . The process comprises loading catalyst in fixed-bed gas-continuous current reactor, introducing methane and H_2/N_2 /inert gas with flow rates of 50–1500 sccm and 50–300 sccm resp., allowing to react at 750–1200° for 10–100 min, and collecting product. The process is simple and high in yield, and the C nanotubes have even diameter and high purity.

IC ICM C01B031-02
ICS B01J023-28; B01J023-887
CC 49-1 (Industrial Inorganic Chemicals)
Section cross-reference(s): 67
ST metal oxide catalyst carbon nanotube prepn
OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS
RECORD (1 CITINGS)

L61 ANSWER 13 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN
ACCESSION NUMBER: 2003:615800 HCAPLUS [Full-text](#)
DOCUMENT NUMBER: 139:352199
TITLE: Synthesis of mesoporous carbon nanotubes and their
application in gas phase benzene hydrogenation
AUTHOR(S): Han, Dong Cheng; Zhu, Zhi Qing; Zhang, Ai Min;
Zhu, Jian Zhong; Dong, Jia lu
CORPORATE SOURCE: Department of Chemistry, Nanjing University,
Nanjing, Peop. Rep. China
SOURCE: Studies in Surface Science and Catalysis (2003), 146(Nanotechnology in
Mesosstructured Materials), 689-692
CODEN: SSCTDM; ISSN: 0167-2991
PUBLISHER: Elsevier Science B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English
ED Entered STN: 12 Aug 2003
AB The multi-wall carbon nanotubes with pore diameter of 30-50 nm, synthesized by
chemical vapor deposition over Co-La catalyst via decomposition of acetylene
at 700°C, were employed as carrier of Ni- loading catalysts and exhibited
excellent conversion of benzene and selectivity for cyclohexane in the gas
phase benzene hydrogenation under atmospheric pressure.
CC 49-1 (Industrial Inorganic Chemicals)
ST carbon nanotube mesoporous synthesis benzene
hydrogenation
REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR
THIS RECORD. ALL CITATIONS AVAILABLE IN THE
RE FORMAT

L61 ANSWER 14 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN
ACCESSION NUMBER: 2003:928275 HCAPLUS [Full-text](#)
DOCUMENT NUMBER: 140:167595
TITLE: CVD synthesis and high pressure treatment of
carbon nanotubes
AUTHOR(S): Kawasaki, S.; Shimada, T.; Komiyama, S.; Okino,
F.; Touhara, H.
CORPORATE SOURCE: Faculty of Textile Science and Technology, Shinshu
University, Ueda, 386-8567, Japan
SOURCE: Proceedings - Electrochemical Society (2003), 2003-15(Fullerenes--Volume 13:
Fullerenes and Nanotubes), 390-394
CODEN: PESODO; ISSN: 0161-6374
PUBLISHER: Electrochemical Society
DOCUMENT TYPE: Journal

LANGUAGE: English

ED Entered STN: 28 Nov 2003

AB To tune the diameter of carbon nanotubes, we have attempted to synthesize carbon nanotubes by catalytic chemical vapor deposition method using mesoporous silica as a catalyst supporting material. We discuss the yield and the structure of the obtained carbon nanotubes using the catalysts loaded into the mesoporous silica in two different ways.

CC 56-8 (Nonferrous Metals and Alloys)
Section cross-reference(s): 67, 78

ST carbon nanotube CVD diam control mesoporous silica catalyst support

IT Metalation
(alumination, catalyst loading process;
catalytic CVD synthesis of carbon nanotubes with diameter control using mesoporous silica as catalyst support and different catalyst loading methods)

IT Nanotubes
(carbon; catalytic CVD synthesis of carbon nanotubes with diameter control using mesoporous silica as catalyst support and different catalyst loading methods)

IT Ion exchange
Wetting
(catalyst loading process; catalytic CVD synthesis of carbon nanotubes with diameter control using mesoporous silica as catalyst support and different catalyst loading methods)

IT Pore size
(catalyst support; catalytic CVD synthesis of carbon nanotubes with diameter control using mesoporous silica as catalyst support and different catalyst loading methods)

IT Particle size
(catalytic CVD synthesis of carbon nanotubes with diameter control using mesoporous silica as catalyst support and different catalyst loading methods)

IT Vapor deposition process
(chemical, catalytic; catalytic CVD synthesis of carbon nanotubes with diameter control using mesoporous silica as catalyst support and different catalyst loading methods)

IT Catalyst supports
(mesoporous silica; catalytic CVD synthesis of carbon nanotubes with diameter control using mesoporous silica as catalyst support and different catalyst loading methods)

IT 106392-12-5, Pluronic P123
(Pluronic P123, silica structure-directing agent; catalytic CVD synthesis of carbon nanotubes with diameter control using mesoporous silica as catalyst support and different catalyst loading methods)

IT 7446-70-0, Aluminum chloride AlCl_3 , processes
(alumination agent; catalytic CVD synthesis of carbon nanotubes with diameter control using mesoporous silica as catalyst support and different catalyst loading methods)

IT 10028-22-5, Iron sulfate $\text{Fe}_2(\text{SO}_4)_3$ 10141-05-6, Cobalt nitrate 13138-45-9, Nickel nitrate 14104-77-9, Iron nitrate
(catalyst source; catalytic CVD synthesis of carbon nanotubes with diameter control using mesoporous silica as catalyst support and different catalyst loading methods)

IT 7439-89-6, Iron, uses 7440-02-0, Nickel, uses 7440-48-4, Cobalt, uses
(catalyst; catalytic CVD synthesis of carbon nanotubes with diameter control using mesoporous silica as catalyst support and different

catalyst loading methods)

IT 7631-86-9, Silica, uses
(mesoporous, catalyst support; catalytic CVD synthesis of carbon nanotubes with diameter control using mesoporous silica as catalyst support and different catalyst loading methods)

IT 7440-44-0P, Carbon, preparation
(nanotubes; catalytic CVD synthesis of carbon nanotubes with diameter control using mesoporous silica as catalyst support and different catalyst loading methods)

IT 57-09-0, Ctab
(silica structure-directing agent; catalytic CVD synthesis of carbon nanotubes with diameter control using mesoporous silica as catalyst support and different catalyst loading methods)

REFERENCE COUNT: 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L61 ANSWER 15 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN
 ACCESSION NUMBER: 2002:906593 HCAPLUS Full-text
 DOCUMENT NUMBER: 138:7493
 TITLE: Methods for manufacture of carbon nanotubes with linear and branched morphology
 INVENTOR(S): Li, Wenzhi; Wen, Jian Guo; Ren, Zhi Feng
 PATENT ASSIGNEE(S): Trustees of Boston College, USA
 SOURCE: PCT Int. Appl., 50 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002095097	A1	20021128	WO 2002-US15619	20020520
<--				
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
AU 2002339758	A1	20021203	AU 2002-339758	20020520
<--				
US 20030004058	A1	20030102	US 2002-151382	20020520
<--				
US 7157068	B2	20070102		
US 20080118426	A1	20080522	US 2006-544329	20061009
<--				
PRIORITY APPLN. INFO.:			US 2001-292486P	P 20010521
<--				
			US 2002-151382	A3 20020520
<--				
			WO 2002-US15619	W 20020520
<--				

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

ED Entered STN: 29 Nov 2002

AB Carbon nanotubes are prepared by feeding a C source gas into a reactor under O-free atmospheric and pressure of 10-5 to 760 Torr and 500-1500°, preferably 650-1050°; the reactor is furnished with a catalyst on a support, which promotes nucleation of C tubules and tubule growth into linear or branched nanotubes. The C source gas is selected from saturated and unsatd. hydrocarbons, i.e., methane, n-propane, ethylene, acetylene, benzene, CO₂, natural gas, coal derived gases and their mixts. The catalyst support is mesoporous sol-gel material, i.e., mesoporous silica or alumina and their mixts.; alternatively, the catalyst comprises metallic and non-metallic materials as supports and the catalyst is a transition metal of metal alloy, selected from Fe, Co, Ni, and combinations. The support materials are: Co and oxides, nitrides, sulfides, or carbides, selected from BeO, MgO, CaO, SrO, and BaO; metallocenes, selected from ferrocene, nickelocene, cobaltocene, and mixts. A promoter gas is optionally used, selected from NH₃, NH₃-N mixts., H, thiophene, iron pentacarbonyl or mixts. Mesoporous silica containing Fe nanoparticles was prepared by sol-gel process by hydrolysis of tetraethoxysilane in the presence of Fe nitrate, dried, calcined for 10 h at 450° and 10-2 Torr to form a silica network with uniform pores and Fe oxide nanoparticles distributed within. The catalyst was used in preparation of linear carbon nanotubes by spreading onto a Mo boat which was placed into a quartz tube reactor; pressure was set at 10-2 torr and temperature 750° in NH₃ and acetylene was introduced to effect nanotube growth for 2 h. The catalyst/support containing nanotubes was washed with HF to recover linear carbon nanotubes.

IC ICM D01F009-12

ICS B01J023-00

CC 57-8 (Ceramics)

ST carbon nanotube manuf hydrocarbon pyrolysis
transition metal catalyst; mesoporous silica
alumina support metal catalyst carbon
nanotube growth; linear graphene carbon
nanotube manuf mesoporous catalyst; magnesia support
cobalt catalyst branched carbon
nanotube growth

IT Nanotubes

(carbon; manufacture of carbon nanotubes of linear and branched
structure using transition metal catalysts on
mesoporous silica or oxide supports)

IT Catalyst supports

Crystal nucleation

(manufacture of carbon nanotubes of linear and branched structure using
transition metal catalysts on mesoporous silica
or oxide supports)

IT Natural gas, processes

(manufacture of carbon nanotubes of linear and branched structure using
transition metal catalysts on mesoporous silica
or oxide supports)

IT Porous materials

(mesoporous; manufacture of carbon nanotubes of linear and branched
structure using transition metal catalysts on
mesoporous silica or oxide supports)

IT Sol-gel processing

(polymerization; manufacture of carbon nanotubes of linear and branched
structure using transition metal catalysts on
mesoporous silica or oxide supports)

IT Polymerization

(sol-gel; manufacture of carbon nanotubes of linear
and branched structure using transition metal
catalysts on mesoporous silica or oxide supports)

IT Hydrocarbons, processes
(unsatd.; manufacture of carbon nanotubes of linear and branched structure using transition metal catalysts on mesoporous silica or oxide supports)

IT 74-86-2, Acetylene, reactions
(carbon precursor; manufacture of carbon nanotubes of linear and branched structure using transition metal catalysts on mesoporous silica or oxide supports)

IT 10421-48-4
(catalyst precursor; manufacture of carbon nanotubes of linear and branched structure using transition metal catalysts on mesoporous silica or oxide supports)

IT 102-54-5, Ferrocene 1271-28-9, Nickelocene 1277-43-6, Cobaltocene 1304-28-5, Barium oxide (BaO), uses 1304-56-9, Beryllium oxide (BeO), uses 1305-78-8, Calcium oxide, uses 1309-48-4, Magnesium oxide (MgO), uses 1314-11-0, Strontium oxide (SrO), uses
(catalyst support; manufacture of carbon nanotubes of linear and branched structure using transition metal catalysts on mesoporous silica or oxide supports)

IT 7631-86-9P, Silica, preparation
(catalyst support; manufacture of carbon nanotubes of linear and branched structure using transition metal catalysts on mesoporous silica or oxide supports)

IT 7440-02-0, Nickel, uses 7440-48-4, Cobalt, uses
(manufacture of carbon nanotubes of linear and branched structure using transition metal catalysts on mesoporous silica or oxide supports)

IT 1344-28-1, Alumina, uses
(manufacture of carbon nanotubes of linear and branched structure using transition metal catalysts on mesoporous silica or oxide supports)

IT 71-43-2, Benzene, processes 74-82-8, Methane, processes 74-85-1, Ethylene, processes 74-98-6, n-Propane, processes 124-38-9, Carbon dioxide, processes
(manufacture of carbon nanotubes of linear and branched structure using transition metal catalysts on mesoporous silica or oxide supports)

IT 11099-06-2P, Tetraethoxysilane homopolymer
(manufacture of carbon nanotubes of linear and branched structure using transition metal catalysts on mesoporous silica or oxide supports)

IT 7440-44-0P, Carbon, preparation
(nanotubes; manufacture of carbon nanotubes of linear and branched structure using transition metal catalysts on mesoporous silica or oxide supports)

IT 110-02-1, Thiophene 1333-74-0, Hydrogen, uses 7664-41-7, Ammonia, uses 7727-37-9, Nitrogen, uses 13463-40-6, Iron pentacarbonyl
(promoter gas; manufacture of carbon nanotubes of linear and branched structure using transition metal catalysts on mesoporous silica or oxide supports)

IT 7439-89-6P, Iron, preparation
(pyrolysis catalyst; manufacture of carbon nanotubes of linear and branched structure using transition metal catalysts on mesoporous silica or oxide supports)

OS.CITING REF COUNT: 29 THERE ARE 29 CAPLUS RECORDS THAT CITE THIS RECORD (33 CITINGS)

REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L61 ANSWER 16 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN
 ACCESSION NUMBER: 2002:204914 HCAPLUS Full-text
 DOCUMENT NUMBER: 136:234234
 TITLE: Manufacture of carbon nanotube
 by laser ablation
 INVENTOR(S): Konakahara, Kaoru; Den, Toru; Iwasaki, Tatsuya
 PATENT ASSIGNEE(S): Canon Inc., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
JP 2002080211	A	20020319	JP 2000-267884	20000905
			<--	
PRIORITY APPLN. INFO.:			JP 2000-267884	20000905
			<--	

ED Entered STN: 19 Mar 2002

AB The nanotube is manufactured by feeding catalyst fine particles by a catalyst heating system with resistance heating and irradiating laser to a C-containing target for ablation. The system may use a resistance heater containing metal catalysts. Since vaporization of the catalysts is controlled by controlling the heating system, the diameter and the yield of the tube are controlled.

IC ICM C01B031-02

ICS B01J035-02; B01J037-34; B28B003-00

CC 49-1 (Industrial Inorganic Chemicals)

Section cross-reference(s): 57

ST carbon nanotube manuf laser ablation catalyst heating

IT Nanotubes

(carbon; manufacture of carbon nanotube by laser ablation with catalyst heating system)

IT Laser ablation

(manufacture of carbon nanotube by laser ablation with catalyst heating system)

IT 7440-02-0, Nickel, uses 7440-48-4, Cobalt, uses 11101-13-6

11148-32-6 12781-95-2

(manufacture of carbon nanotube by laser ablation with catalyst heating system)

IT 7440-44-0, Carbon, processes

(nanotubes; manufacture of carbon nanotube by laser ablation with catalyst heating system)

OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)

L61 ANSWER 17 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 2002:383580 HCAPLUS Full-text

DOCUMENT NUMBER: 137:11527

TITLE: Growth mechanism of Y-junction carbon nanotubes

AUTHOR(S): Zhu, Hongwei; Ci, Lijie; Xu, Cailu; Liang, Ji; Wu, Dehai

CORPORATE SOURCE: Dept. of Mechanical Engineering, Tsinghua University, Beijing, 100084, Peop. Rep. China

SOURCE: Diamond and Related Materials (2002), 11(7), 1349-1352

CODEN: DRMT3; ISSN: 0925-9635

PUBLISHER: Elsevier Science S.A.

DOCUMENT TYPE: Journal
 LANGUAGE: English
 ED Entered STN: 23 May 2002

AB The growth mechanism of Y-junction carbon nanotubes (CNTs) prepared by floating catalyst method has been investigated by transmission electron microscopy (TEM). The branch of Y-junction CNT is much shorter than the stem CNT, and the trace of metal particle is observed clearly along the branch carbon nanotube. We present several evidences for a metal particle catalytic growth mechanism. A simple growth model was built to describe the growth process of Y-junction carbon nanotubes.

CC 67-3 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
 ST growth mechanism Y junction carbon nanotube

IT Catalysts

Reaction mechanism

(growth mechanism of Y-junction carbon nanotubes)

OS.CITING REF COUNT: 36 THERE ARE 36 CAPLUS RECORDS THAT CITE THIS RECORD (36 CITINGS)

REFERENCE COUNT: 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L61 ANSWER 18 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 2001:876585 HCAPLUS Full-text

DOCUMENT NUMBER: 135:379820

TITLE: Method of growth of branched carbon nanotubes and devices produced from the branched nanotubes

INVENTOR(S): Li, Jing; Papadopoulos, Christo; Xu, Jingming

PATENT ASSIGNEE(S): The Governing Council of the University of Toronto, Can.

SOURCE: U.S., 15 pp.
 CODEN: USXXAM

DOCUMENT TYPE: Patent
 LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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US 6325909	B1	20011204	US 1999-453810	19991203

PRIORITY APPLN. INFO.: US 1999-155636P P 19990924
 <--

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

ED Entered STN: 06 Dec 2001

AB A method of producing Y-junction carbon nanotubes. An alumina template with branched growth channels is produced after which individual Y-junction carbon nanotubes are grown directly by pyrolysis of acetylene using cobalt catalysis. The use of a branched growth channel allows the natural simultaneous formation of a very large number of individual but well-aligned three-port Y-junction carbon nanotubes with excellent uniformity and control over the length (up to several tens μ m) and diameter (15-100 nm) of the "stem" and "branches" sep. These Y-junctions offer the nanoelectronics community a new base material for mol. scale electronic devices including for example transistors and rectifiers.

IC ICM C25D005-18

ICS C25D011-22; C25D005-48; C25D011-04

INCL 205106000

CC 76-3 (Electric Phenomena)

Section cross-reference(s): 23, 56, 67

ST branched carbon nanotube growth
semiconductor junction anodized aluminum

IT Catalysts
(electrodeposition of metal catalyst in
aluminum anodizing film pores in process of growth of branched
carbon nanotubes)

IT Alloys, processes
(electrodeposition of metal catalyst in
aluminum anodizing film pores in process of growth of branched
carbon nanotubes)

IT Electrodeposition
(of metal catalyst in aluminum anodizing film
pores in process of growth of branched carbon nanotubes)

IT 7439-89-6P, Iron, processes 7439-98-7P, Molybdenum, processes
7440-02-0P, Nickel, processes 7440-06-4P, Platinum, processes
7440-48-4P, Cobalt, processes 7440-50-8P, Copper, processes
(electrodeposition of metal catalyst in
aluminum anodizing film pores in process of growth of branched
carbon nanotubes)

OS.CITING REF COUNT: 28 THERE ARE 28 CAPLUS RECORDS THAT CITE THIS
RECORD (28 CITINGS)

REFERENCE COUNT: 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR
THIS RECORD. ALL CITATIONS AVAILABLE IN THE
RE FORMAT

=> d 19-23 full

L61 ANSWER 19 OF 38 WPIX COPYRIGHT 2010 THOMSON REUTERS on STN

AN 2007-893536 [200782] WPIX Full-text

CR 2006-446023

DNC C2007-304985 [200782]

DNN N2007-710046 [200782]

TI Nanowire, useful in e.g. fuel cell such as direct methanol fuel cell
or hydrogen fuel cell, fuel cell electrode, conducting composite and
porous catalyst support, comprises a carbon-based layer

DC A85; L03; P42; U12; V01; V04; V05; X16

IN NIU C; QIAN B; STEFAN I

PA (NANO-N) NANOSYS INC; (NIUC-I) NIU C

CYC 117

PI WO 2007061945 A2 20070531 (200782)* EN 155[38]
US 20070212538 A1 20070913 (200782) EN
EP 1952467 A2 20080806 (200854) EN
AU 2006318658 A1 20070531 (200858) EN
US 20080280169 A1 20081113 (200903) EN
CA 2624776 A1 20070531 (200929) EN
KR 2008070769 A 20080730 (200929) KO
WO 2007061945 A3 20090430 (200930) EN
JP 2009524567 W 20090702 (200943) JA 69
CN 101563801 A 20091021 (200972) ZH

ADT WO 2007061945 A2 WO 2006-US44883 20061120; US 20070212538 A1
Provisional US 2004-634472P 20041209; US 20080280169 A1
Provisional US 2004-634472P 20041209; US 20070212538 A1
Provisional US 2005-738100P 20051121; US 20080280169 A1 Provisional US
2005-738100P 20051121; US 20070212538 A1 CIP of US 2005-295133
20051206; US 20080280169 A1 CIP of US 2005-295133 20051206; US
20070212538 A1 Provisional US 2006-801377P 20060519; US 20080280169 A1
Provisional US 2006-801377P 20060519; AU 2006318658 A1 AU 2006-318658
20061120; CA 2624776 A1 CA 2006-2624776 20061120; EP 1952467 A2 EP
2006-838053 20061120; US 20070212538 A1 US 2006-601842 20061120; US

20080280169 A1 CIP of US 2006-601842 20061120; EP 1952467 A2 PCT Application WO 2006-US44883 20061120; CA 2624776 A1 PCT Application WO 2006-US44883 20061120; KR 2008070769 A PCT Application WO 2006-US44883 20061120; WO 2007061945 A3 WO 2006-US44883 20061120; JP 2009524567 W PCT Application WO 2006-US44883 20061120; CA 2624776 A1 PCT Nat. Entry CA 2006-2624776 20080403; US 20080280169 A1 US 2007-808760 20070612; JP 2009524567 W JP 2008-541404 20061120; KR 2008070769 A KR 2008-715163 20080620; CN 101563801 A CN 2006-80043546 20061120; CN 101563801 A PCT Application WO 2006-US44883 20061120

FDT US 20070212538 A1 CIP of US 7179561 B; US 20080280169 A1 CIP of US 7179561 B; EP 1952467 A2 Based on WO 2007061945 A; AU 2006318658 A1 Based on WO 2007061945 A; CA 2624776 A1 Based on WO 2007061945 A; KR 2008070769 A Based on WO 2007061945 A; JP 2009524567 W Based on WO 2007061945 A; CN 101563801 A Based on WO 2007061945 A

PRAI US 2005-738100P 20051121
US 2006-801377P 20060519
US 2004-634472P 20041209
US 2005-295133 20051206
US 2006-601842 20061120
US 2007-808760 20070612

IPCI B01J0023-42 [I,A]; B01J0023-42 [I,C]; B01J0023-46 [I,A]; B01J0023-46 [I,C]; B01J0023-48 [I,C]; B01J0023-52 [I,A]; B01J0032-00 [I,A]; B01J0032-00 [I,C]; B01J0035-00 [I,C]; B01J0035-02 [I,A]; B05D0005-12 [I,A]; B05D0005-12 [I,C]; B05D0007-00 [I,A]; B05D0007-00 [I,C]; B82B0001-00 [I,A]; B82B0001-00 [I,C]; B82B0003-00 [I,A]; B82B0003-00 [I,C]; B82B0003-00 [I,C]; C01B0031-02 [I,A]; C01B0031-36 [I,A]; C01B0033-00 [I,C]; C01B0033-02 [I,A]; D02G0003-00 [I,A]; D02G0003-00 [I,C]; H01B0001-04 [I,A]; H01B0001-04 [I,C]; H01G0009-058 [N,A]; H01G0009-058 [N,C]; H01M0004-58 [I,A]; H01M0004-58 [I,C]; H01M0004-86 [I,A]; H01M0004-86 [I,C]; H01M0004-86 [I,C]; H01M0004-86 [I,C]; H01M0004-88 [I,A]; H01M0004-88 [I,C]; H01M0004-88 [I,C]; H01M0004-90 [I,C]; H01M0004-90 [I,C]; H01M0004-92 [I,A]; H01M0004-92 [I,C]; H01M0004-96 [I,A]; H01M0004-96 [I,C]; H01M0008-00 [I,A]; H01M0008-00 [I,C]; H01M0008-10 [I,C]; H01M0008-10 [I,C]

EPC H01B0001-04; H01M0004-86B; H01M0004-86K2; H01M0004-88; H01M0004-92; H01M0008-10B; H01M0008-10S

ICO T01M0004:133; T01M0004:62C2; T01M0004:90C; T01M0004:92S2; Y01N0006:00

NCL NCLM 428/367.000; 429/013.000
NCLS 252/502.000; 252/507.000; 252/508.000; 427/115.000; 427/215.000; 429/012.000; 429/044.000; 429/231.800; 502/101.000

FCL B01J0023-42 M; B01J0023-46 M; B01J0023-52 M; B01J0032-00; B01J0035-02 311 Z; B82B0001-00; B82B0003-00; C01B0031-02 101 Z; C01B0031-36 601 S; C01B0033-02 Z; H01B0001-04; H01G0009-00 301 B; H01M0004-58 103; H01M0004-86 B; H01M0004-86 M; H01M0004-96 B; H01M0004-96 M; H01M0008-10

Main: C01B0031-02 101 Z
Secondary: B01J0023-42 M; B01J0023-46 M; B01J0023-52 M; B01J0032-00; B01J0035-02 311 Z; B82B0001-00; B82B0003-00; C01B0031-36 601 S; C01B0033-02 Z; H01B0001-04; H01M0004-58 103; H01M0004-86 B; H01M0004-86 M; H01M0004-96 B; H01M0004-96 M; H01M0008-10

Additional: H01G0009-00 301 B

FTRM 3C082; 4G072; 4G146; 4G169; 5E078; 5G301; 5H018; 5H026; 5H050; 4G072/AA01; 4G169/AA01; 4G146/AA02; 4G169/AA03; 5H018/AA07; 4G169/AA08; 5H026/AA08; 4G169/AA11; 4G146/AA19; 4G072/AA41; 4G146/AB07; 4G146/AD23; 5G301/BA01; 5G301/BA02; 5G301/BA03; 4G169/BA08.A; 4G169/BA08.B; 4G146/BA12; 5E078/BA15; 5H050/BA16;

4G146/BA48; 5H018/BB01; 5H026/BB01; 4G169/BB02.A; 4G169/BB02.B;
 4G169/BB04.A; 4G072/BB04; 5H026/BB04; 5H018/BB07; 4G169/BB15.A;
 4G072/BB20; 4G146/BB22; 4G146/BC09; 4G169/BC16.A; 4G169/BC17.A;
 4G169/BC22.A; 4G146/BC23; 4G146/BC25; 4G169/BC31.A; 4G169/BC32.A;
 4G169/BC33.A; 4G169/BC33.B; 4G146/BC34.B; 4G169/BC35.A; 4G146/BC43;
 4G169/BC50.A; 4G169/BC51.A; 4G169/BC52.A; 4G169/BC55.A; 4G169/BC56.A;
 4G169/BC58.A; 4G169/BC59.A; 4G169/BC60.A; 4G169/BC62.A; 4G169/BC63.A;
 4G169/BC64.A; 4G169/BC66.B; 4G169/BC67.A; 4G169/BC68.A; 4G169/BC70.A;
 4G169/BC70.B; 4G169/BC71.A; 4G169/BC72.A; 4G169/BC73.A; 4G169/BC74.A;
 4G169/BC75.A; 4G169/BC75.B; 4G169/BD05.A; 4G169/BD05.B; 5H050/CB01;
 5H050/CB07; 5H050/CB08; 5H026/CC01; 5H026/CC03; 4G169/CC32;
 5H026/CX02; 5H050/DA03; 4G169/DA05; 5H018/DD05; 4G169/EA03.X;
 4G169/EA03.Y; 5H018/EE02; 5H026/EE02; 5H018/EE03; 5H018/EE05;
 5H026/EE05; 5H026/EE08; 5H018/EE10; 5H018/EE11; 5H026/EE11;
 5H018/EE12; 5H026/EE12; 4G169/FA02; 5H050/FA18; 4G169/FB15;
 4G072/FF07; 5H050/GA02; 5H050/GA16; 5H050/GA21; 4G072/GG02;
 4G072/GG03; 5H050/HA04; 5H050/HA05; 5H050/HA07; 5H050/HA14;
 4G072/HH01; 5H018/HH01; 5H026/HH01; 5H018/HH03; 5H026/HH03;
 5H018/HH05; 5H026/HH05; 5H018/HH08; 5H026/HH08; 4G072/JJ09;
 4G072/JJ47; 4G146/MA14; 4G146/MB03; 4G146/MB14; 4G146/MB27;
 4G146/NA12; 4G146/NB05; 4G146/NB14; 4G072/QQ09; 4G072/RR11;
 4G072/UU15; 4G072/UU30

AB WO 2007061945 A2 UPAB: 20090509

NOVELTY - Nanowire (I) comprises a carbon-based layer.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are included for:

- (1) a nanowire structure, comprising a core, an interfacial carbide layer and a carbon-based structure formed on the interfacial carbide layer;
- (2) a solution comprising nanowire structures or (I);
- (3) the preparation of (I) comprising heating the nanowire core; and contacting the nanowire core with carbon comprising gases to form a carbon-based layer on the nanowire core;
- (4) a preparation of the nanowire structure comprising heating the nanowire core; contacting the nanowire core with carbon comprising gases to form an interfacial carbide layer on the nanowire core; and forming at least one carbon-based structure on the interfacial carbide layer;
- (5) an interconnected nanowire network, comprising many nanowire structures, where the nanographitic plates connect the nanowire structures;
- (6) a catalyst comprising: either an interconnected nanowire structure and active catalytic nanoparticles dispersed on the surface of the interconnected nanowire structure; or (I);
- (7) a membrane electrode assembly comprising: either the catalyst, proton exchange membrane, anode electrode, and cathode electrode, where at least one or more of the anode electrodes and cathode electrodes comprise an interconnected network of nanowires; or first fuel cell electrode, proton exchange membrane, and second fuel cell electrode;
- (8) an lithium battery comprising an anode comprising the interconnected nanowire structure, cathode, separator and a lithium electrolyte;
- (9) an electrochemical capacitor comprising two electrodes comprising the interconnected nanowire structure, separator and an electrolyte;
- (10) a chromatographic medium comprising many particles;
- (11) a high surface area electrode comprising the interconnected nanowire structure;
- (12) a preparation of the interconnected nanowire network comprising dispersing many nanowire cores in a liquid; filtering the nanowire cores to create a nanowire mat; heating the nanowire mat; contacting the nanowire mat with carbon comprising gases to form interfacial carbide layers on the nanowire cores; and forming nanographitic plates on the interfacial carbide layers, such that that nanographitic plates interconnect the nanowire cores;
- (13) a fuel cell comprising (I) or the membrane electrode assembly;

(14) a nanostructured catalyst support for a membrane electrode assembly of a fuel cell comprising a network of inorganic nanowires each having a metal catalyst deposited on it;

(15) a preparation of the fuel cell membrane electrode assembly comprising either associating a catalyst metal such as chromium, molybdenum, tungsten, manganese, technetium, rhenium, iron, ruthenium, osmium, cobalt, rhodium, iridium, nickel, palladium, platinum, copper, silver, gold, zinc, tin and/or aluminum, with many inorganic nanowires to give many inorganic nanowires with associated catalyst metal, and forming the membrane electrode assembly comprising many inorganic nanowires with associated catalyst metal; or providing a gas diffusion layer, disposing a first composition of catalyst metal-associated nanowires adjacent the gas diffusion layer, disposing a membrane layer adjacent the first catalyst metal-associated nanowire composition, and disposing a second composition of catalyst metal-associated nanowires adjacent the membrane layer;

(16) a preparation of the membrane electrode assembly for the fuel cell, comprising: forming nanowires on a growth substrate; transferring the nanowires from the growth substrate into a fluid suspension; depositing catalyst metals on the nanowires to form a nanowire supported catalyst; filtering the fluid suspension of nanowires to create a porous sheet of interconnected nanowires; infiltrating the sheet of interconnected nanowires with an ionomer; and combining the sheet of interconnected nanowires with a polymer membrane to form the membrane electrode assembly;

(17) a bipolar plate for the fuel cell comprising many inorganic nanowires deposited on it;

(18) a fuel cell electrode comprising: an inorganic support wafer having a first surface comprising one or more channels; nanowires disposed within the channels; and metal catalysts deposited on a surface of the nanowires;

(19) a preparation of the fuel cell electrode comprising providing the semiconductor wafer having a first surface and a second surface; forming one or more channels on the first surface and the second surface; disposing nanowires in the channels in the first and second surfaces; contacting the nanowires and the first and second surfaces with carbon-comprising gases to form a carbon-based layer on the nanowires and the first and second surfaces; and disposing metal catalysts on the nanowires;

(20) a field emission element comprising the nanowire structure;

(21) a preparation of a fuel cell electrode stack comprising: providing a first end plate; disposing a first gasket adjacent the end plate; disposing the membrane electrode assembly adjacent the first gasket; disposing a gas diffusion layer adjacent the membrane electrode assembly; disposing a second gasket adjacent the gas diffusion layer; and disposing a second end plate adjacent the second gasket;

(22) a preparation of nanowires comprising catalyst metals associated with the nanowires, comprising: dispersing nanowires in a solution; adding catalyst metals to the solution; and refluxing the solution to associate the catalyst metals with the nanowires; and

(23) a conducting composite, and a porous catalyst support comprising nanowires.

USE - The nanowire structures is useful in field emission element and interconnected nanowire network, which is useful in catalyst, membrane electrode assembly, lithium battery, electrochemical capacitor, chromatographic medium and high surface area electrode. (I) is useful in fuel cell (such as direct methanol fuel cell or hydrogen fuel cell), bipolar plate for the fuel cell, fuel cell electrode, conducting composite and a porous catalyst support (all claimed).

ADVANTAGE - (I) maximizes catalyst utilization, catalyst accessibility and electrical and ionic connectivity. (I) improves the overall efficiency of fuel cells, at lower cost. (I) provides a highly porous material with a high surface area, a high structural stability and a continuum structure.

TECH INORGANIC CHEMISTRY - Preferred Composition: (I) further comprises a core. Preferred Components: The carbon-based layer is substantially devoid of basal plane carbon. (I) comprises the metal catalyst deposited on a surface of the nanowires. In (I), when the core is silicon, the carbon based layer is silicon carbide, and when the core is silicon carbide, the carbon based layer is carbon. The core comprises: semiconductor material; an inorganic oxide such as silicon dioxide, aluminum oxide, titanium dioxide, tin oxide, zirconium oxide, hafnium oxide or tantalum oxide; an inorganic carbide such as titanium carbide, zirconium carbide, hafnium carbide, niobium carbide, tungsten carbide, double tungsten carbide, molybdenum carbide or double molybdenum carbide; or an inorganic nitride such as titanium nitride, zirconium nitride, hafnium nitride, tungsten nitride, molybdenum nitride or boron nitride. The semiconductor material is group IV, group II-VI, group III-V semiconductors and/or alloys, preferably silicon carbide. The semiconductor material is highly doped. The core and/or the carbon based layer comprise carbon. The carbon-based layer is 1-500 nm in thickness. The carbon-based structure comprises at least one nanographitic plate formed on the interfacial carbide layer. The interfacial carbide layer is silicon carbide, titanium carbide, zirconium carbide, hafnium carbide, niobium carbide, tungsten carbide and/or molybdenum carbide. The core has a cross-sectional diameter of less than about 500 nm and a length of greater than about 50 (preferably 10) nm. In nanowire structure, at least one nanographitic plate extends away from the core at a distance of 1-100 nm, comprises at least 2-15 layers of graphene, and oriented relative the major axis of the core at an angle of 0-90degreesC. The solution further comprises a surfactant, polymer and/or an ionomer. The nanowire structures comprise 0.1-20 vol.% of solution. The network forms a mesoporous membrane or particle. The metal catalyst comprises nanometer-sized catalyst particles having a diameter of 1-10 nm. The metal catalyst is platinum, gold, palladium, ruthenium, rhodium, osmium, iridium, iron, cobalt, nickel, copper, silver, vanadium, chromium, molybdenum, tungsten and/or alloys. The nanowires are branched structures. The catalyst metal comprises nanoparticles having a diameter less than 10-5 nm. The metal catalyst is deposited on the nanowires by using a process such as chemical vapor deposition, electrochemical deposition, electrodeless chemical plating, physical vapor deposition, solution impregnation and precipitation, colloid particle absorption and desorption, binding through a chemical linker and/or atomic layer deposition. In the nanostructured catalyst support, each nanowire in the network of nanowires is physically connected to at least one or more other nanowires in the nanowire network and/or a bipolar plate. The nanowire is ruthenium oxide, silicon carbide, gallium nitride, titanium oxide, tin oxide or metal nitride or carbide of formula WC_x, MoC_x, ZrC, WN_x or MoN_x (where x is whole positive integer). The nanowires in the network of nanowires are each functionalized with at least a first chemical binding moiety. The nanostructured catalyst support further comprises a proton conducting polymer in contact with the nanowires. The membrane electrode assembly is a component in a direct methanol fuel cell. The nanostructured catalyst support comprises 0.5-85 wt.% or 20-80 wt.% of the catalyst metal. The nanowires has a metal catalyst deposited on it. In the membrane electrode assembly, each nanowire in the network of nanowire is contacted by at least one other nanowire in the nanowire network and is electrically connected to one or more other nanowires in the nanowire network. The nanowires in the network of nanowires has a branched structure. The

nanowires in the network of nanowires are each functionalized with a first chemical binding moiety, which binds the metal catalyst. The nanowires in the network of nanowires are each functionalized with a chemical binding moiety, which binds a proton conducting polymer coating the nanowires. The proton conducting polymer coating comprises a sulfonated polymer, preferably tetrafluoroethylene copolymer. The inorganic support wafer is a silicon wafer. The wafer has a second surface comprising channels opposite the first surface, nanowires disposed within the channels in the second surface, and metal catalysts deposited on a surface of the nanowires, where the surface and/or the nanowires are carburized. The proton exchange membrane is sandwiched between the first surface of the first fuel cell electrode and the second surface of the second fuel cell electrode. The first surface of the first fuel cell electrode comprises nanowires with anodic metallic catalysts and the second surface of the second fuel cell electrode comprises nanowires with cathodic metallic catalysts. The anionic metallic catalysts are platinum ruthenium and the cationic metallic catalysts are platinum. In the porous catalyst support, one or more nanowires are separated by a pore size of less than about 10 microns. In the fuel cell, (I) is: deposited on the surface of a proton exchange membrane or bipolar plates of the fuel cell; or directly grown on bipolar plates of the fuel cell or the proton exchange membrane of the fuel cell. (I) comprises carbon nano tube or silicon nanowire core and one or more shell layers disposed about the core, where the outermost shell layer comprises silicon carbide having a catalyst metal deposited on silicon carbide. The silicon carbide shell layer is functionalized with a proton conducting coating comprising a perfluorinated sulfonated hydrocarbon molecule. Preferred Process: The heating step is carried out at greater than about 600degreesC. The contacting step comprises contacting with a gas comprising carbon monoxide, methane, ethane, propane, butane, ethylene or propylene and optionally further comprises contacting with a gas comprising helium, neon, argon, krypton, xenon or hydrogen. The process of preparing (I), nanowire structure and interconnected nanowire network further comprises forming a precursor coating of titanium dioxide, zirconium oxide, hafnium oxide, niobium oxide, tantalum oxide, molybdenum trioxide or tungsten oxide on the nanowire core, before the heating step. The step of forming carbon-based structure comprises: forming at least one nanowire on the interfacial carbide layer; and forming at least one nanographitic plate on the interfacial carbide layer. In the preparation of the nanowire structure, the contacting step further comprises heating the nanowire core to a second temperature of greater than about 1000degreesC to form the carbon-based structure. In the preparation of the interconnected nanowire network, the contacting step further comprises heating the nanowire mat to a second temperature of greater than about 1000°C to form the nanographitic plates. The preparation of the fuel cell membrane electrode assembly further comprises: either annealing the nanowires with associated catalyst metal before forming the membrane electrode, cross-linking many nanowires together at points, where such nanowires contact are proximal to others of the nanowires, and mixing an ionomeric resin comprising a perfluorosulfonic acid/polytetrafluoroethylene copolymer with many inorganic nanowires with associated catalyst metal; or disposing a masking layer adjacent the gas diffusion layer to cover at least the edges of the gas diffusion layer, before disposing the first composition of catalyst metal-associated nanowires, removing the masking layer after disposing the first composition, but before

disposing the membrane layer, and disposing a masking layer on the membrane layer to cover at least the edges of the membrane layer before disposing the second composition of catalyst metal-associated nanowires. The associating comprises chemically depositing a catalyst metal precursor. The step of forming membrane electrode assembly is carried out by spray/brush painting, solution coating, casting, electrolytic deposition and/or filtering a fluid suspension of the nanowires. The step of depositing catalyst metals on the nanowires is carried out by an electrodeposition process. The preparation of membrane electrode assembly further comprises: forming a proton exchange membrane fuel cell utilizing the formed electrode by adding first and second bipolar plates on either side of the polymer membrane; sealing the bipolar plates to form the proton exchange membrane fuel cell; and derivatizing the nanowires with a first functional group comprising a nitric oxide/acid group, carboxylic acid group, hydroxyl group, amine group and/or a sulfonic acid group, before depositing the metal catalyst on the nanowires, or derivatizing the nanowires with a functional group such as a short hydrocarbon, fluorocarbon or branched hydrocarbon chain which binds the ionomer to the nanowires. The filtering step comprises vacuum filtration of the nanowire fluid suspension over a polyvinylidene fluoride membrane. In the preparation of the membrane electrode assembly, the deposition step is performed before or after filtering. The step of forming channels comprises etching, which is carried out with sodium hydroxide. The step of disposing nanowires comprises growing nanowires in the channels. The step of disposing of metal catalysts on the nanowires comprises depositing platinum nanoparticles on nanowires on the first surface and platinum ruthenium nanoparticles on nanowires on the second surface. The dispersing step comprises dispersing in a solution comprising ethylene glycol. The refluxing step comprises heating the solution to boiling. The step of disposing a first and second solution of catalyst metal-associated nanowires comprises disposing a solution of catalyst-associated nanowires, and optionally ionomers. The step of disposing a first composition of catalyst metal-associated nanowires comprises disposing a solution of anode catalyst-associated nanowires. The step of disposing a second composition of catalyst metal-associated nanowires comprises disposing a solution of cathode catalyst-associated nanowires. The step of disposing the first composition of catalyst metal-associated nanowires and the second composition of catalyst metal-associated nanowires comprise spraying a solution of the nanowires and one or more ionomers. The spraying comprises spraying multiple layers of the nanowires and ionomers. The step of disposing a membrane layer comprises: spraying the membrane layer; and disposing the proton conducting polymer layer. The process of preparing fuel cell electrode stack further comprises, for a second through nth membrane electrode assemblies, after disposing the second gasket adjacent the gas diffusion layer in part (e), but before disposing the second end plate in part (f), disposing a first bipolar plate adjacent the second gasket, disposing a third gasket adjacent the bipolar plate, disposing the second membrane electrode assembly adjacent the third gasket, disposing the second gas diffusion layer adjacent the second membrane electrode assembly, disposing a fourth gasket adjacent the second gas diffusion layer, and repeating elements all steps until the nth membrane electrode assembly has been disposed. The dispersing step comprises: dispersing in a solution comprising ethylene glycol; dispersing nanowires that are derivatized with at

least a first functional group which binds the catalyst metal; and dispersing an interconnected network of nanowires in which two or more nanowires in the network are physically and/or electrically coupled to each other. The refluxing step comprises heating the solution to boiling. The step of dispersing derivatized nanowires comprises dispersing nanowires, where the first functional group includes a group of a nitric acid, carboxylic acid group, hydroxyl group, amine group or a sulfonic acid group. The adding step comprises adding a catalyst metal comprising platinum, or platinum and ruthenium, where the catalyst metal is nanoparticles. The process of preparing catalyst metals associated with (I) further comprises: filtering the refluxed solution to generate a solid nanowire dispersion with associated catalyst metals; drying the solid nanowire dispersion; and cross-linking many nanowires together at points where such nanowires contact are proximal to others of the nanowires.

ABEX EXAMPLE - Silicon nanowires coated with tungsten oxide were heated at 650degreesC for 30 minutes, followed by 1250degreesC for 6 minutes in the presence of a flowing gas mixture comprising argon (430 cc/minutes), hydrogen (130 cc/minutes) and methane in argon (228 cc/minutes). After the preparation was cooled, an interconnected nanowire network 300 comprising interconnected nanowire structures 100 (comprising silicon nanowire cores 102, carbon based layers 104 (silicon carbide/tungsten carbide interfacial carbide layers) and carbon-based structures 106 (graphene nanographitic plates) connecting the nanowire structures 100) were formed.

FS CPI; GMPI; EPI

MC CPI: A12-E01; A12-W14; L03-A02B; L03-A02G; L03-E04B

EPI: U12-B03F2A; V01-B01A4; V04-X01B1; V05-M03A1; X16-E06A1A

L61 ANSWER 20 OF 38 WPIX COPYRIGHT 2010 THOMSON REUTERS on STN

AN 2006-403100 [200641] WPIX Full-text

DNC C2006-127946 [200641]

DNN N2006-336089 [200641]

TI Formation of Y-branched single wall nanotubes, for use as e.g. nanoscale transistors, by applying particles of solution of ions and metal oxide particles, drying solution on substrate, placing substrate in reactor, heating and flowing gas

DC L02; L03; U11

IN CHOI W; CHOI Y C

PA (UYFL-C) UNIV FLORIDA

CYC 111

PI WO 2006057833 A2 20060601 (200641)* EN 30[12]

US 20080296558 A1 20081204 (200882) EN

ADT WO 2006057833 A2 WO 2005-US40995 20051114; US 20080296558 A1

Provisional US 2004-627355P 20041112; US 20080296558 A1 PCT

Application WO 2005-US40995 20051114; US 20080296558 A1 US 2008-718975 20080724

PRAI US 2004-627355P 20041112

US 2008-718975 20080724

IPCI B05D0005-12 [I,A]; B05D0005-12 [I,C]; B32B0015-04 [I,A]; B32B0015-04 [I,C]; C01B0031-00 [I,C]; C01B0031-02 [I,A]; H01L0029-02 [I,C];

H01L0029-12 [I,A]; H01L0051-05 [I,C]; H01L0051-30 [I,A]

EPC C01B0031-02B; H01L0051-00M4D; H01L0051-00T

ICO Y01N0004:00; Y01N0006:00

NCL NCLM 257/024.000

NCLS 257/E29.069; 427/122.000; 428/457.000; 428/688.000

AB WO 2006057833 A2 UPAB: 20060629

NOVELTY - Y-branched single wall nanotubes are formed by applying, to a substrate, particles of a solution of a mixture of metal catalyst ions, dopant metal ions and metal oxide particles; drying the solution on the substrate to form defined nanotube nucleation sites; placing the substrate in a chemical vapor deposition (CVD) reactor; heating the CVD reactor to the reaction temperature of 600-1,200degreesC; and flowing a hydrocarbon gas through the reactor.

DETAILED DESCRIPTION - Formation of Y-branched single-wall nanotubes comprises:

(a) applying, to a substrate, particles of a solution of a mixture of metal catalyst ions, dopant metal ions and metal oxide particles, where the dopant metal forms a dopant metal carbide more easily than formation of a catalyst metal carbide at a reaction temperature;

(b) drying the solution of catalyst metal ions, dopant metal ions and metal oxide particles on the substrate to form defined nanotube nucleation sites;

(c) placing the substrate containing the dried catalyst metal, dopant metal and metal oxide mixture in a chemical vapor deposition (CVD) reactor;

(d) heating the CVD reactor to the reaction temperature of 600-1,200degreesC; and

(e) flowing a hydrocarbon gas through the CVD reactor at a flow rate sufficient to form the Y-branched single-wall nanotubes.

INDEPENDENT CLAIMS are also included for:

(1) a single wall Y-branched carbon nanotube having a stem formed in an armchair hexagonal carbon structure and having Y-branches formed from a zigzag hexagonal carbon structure; and

(2) a Y-junction single wall carbon nanotube device comprising a Y-branched single wall carbon nanotube formed by the process including a stem, a first arm, and a second arm, where a first proximal end of the stem, first arm and second arm are coupled at a heterojunction, a first electrode electrically coupled to a distal end of the stem, a second electrode electrically coupled to a distal end of the first arm and a third electrode electrically coupled to a distal end of the second arm.

USE - For forming Y-branched single wall nanotubes for use as nanoelectronic devices e.g. nanoscale transistors.

ADVANTAGE - The process produces Y-SWNT in a controlled manner.

TECH METALLURGY - Preferred Material: The catalyst metal ions are iron ions. The dopant metal ions are titanium (Ti), zirconium (Zr), hafnium (Hf), vanadium (V), niobium (Nb), Ta, chromium (Cr), tungsten (W) and/or preferably molybdenum (Mo) ions.

FS CPI; EPI

MC CPI: L02-H04B; L04-C01B; L04-E01

EPI: U11-C01B; U11-C01J6

L61 ANSWER 21 OF 38 WPIX COPYRIGHT 2010 THOMSON REUTERS on STN

AN 2005-757074 [200577] WPIX Full-text

DNC C2005-230985 [200577]

DNN N2005-624699 [200577]

TI Formation of branched carbon nanotubes for transistors, involves adding dopant, having more favorable carbide-forming reaction at reactor conditions than catalyst provided by second precursor material, to precursor materials

DC E36; U11; U12

IN GAILLARD J B; GOTHARD N W; RAO A M

PA (UYCL-N) UNIV CLEMSON

CYC 1

PI US 20050238566 A1 20051027 (200577)* EN 16[8]

US 7144563 B2 20061205 (200680) EN

ADT US 20050238566 A1 US 2004-829660 20040422

PRAI US 2004-829660 20040422

IPCI B01J0021-00 [I,C]; B01J0021-06 [I,A]; B01J0023-745 [I,A]; B01J0023-745 [I,C]; C01B0031-00 [I,C]; C01B0031-02 [I,A]; D01F0009-12 [I,C]; D01F0009-127 [I,A]

IPCR D01F0009-12 [I,A]; D01F0009-12 [I,C]

EFC D01F0009-127

ICO Y01N0006:00

NCL NCLM 423/447.300

NCLS 428/398.000; 428/401.000; 502/338.000; 502/349.000; 502/350.000

AB US 20050238566 A1 UPAB: 20060125

NOVELTY - Branched carbon nanotubes are formed by adding dopant to precursor materials. The dopant can be a material having a thermodynamically more favorable carbide-forming reaction at reactor conditions than a catalyst provided by a second precursor material.

DETAILED DESCRIPTION - Formation of branched carbon nanotubes involves providing a first precursor material comprising a catalyst for catalyzing the formation of a carbon nanotube according to a chemical-vapor deposition; providing a second precursor material comprising a dopant capable of forming a carbide when reacted with carbon; mixing the precursor materials together; vaporizing the precursor materials; heating the vaporized mixture of precursor materials to a reaction temperature in a reactor; providing a carbon source to the reactor; vaporizing the carbon source; heating the vaporized carbon source to the reaction temperature in the reactor; and forming a carbon nanotube in the reactor according to a chemical-vapor deposition process, wherein the carbon nanotube comprises one or more branches. The catalyst is capable of forming carbide when reacted with carbon. The carbide forming reaction of the dopant is more thermodynamically favorable than the carbide-forming reaction of the catalyst at the reactor conditions.

USE - For forming branched nanotubes (claimed) used in the miniaturization of transistors for computers.

ADVANTAGE - The invention forms branched carbon nanotubes, e.g. Y-junction carbon nanotubes that can be easily sized for bulk formation processes, and includes a scheme to control the location and length of the branches formed along the length of the nanotubes. It enhances the production of nanotubes while minimizing build-up of amorphous carbon within the reactor.

DESCRIPTION OF DRAWINGS - The figure shows images of branched multiwalled nanotubes.

TECH INORGANIC CHEMISTRY - Preferred Component: The catalyst is iron. The dopant is titanium, hafnium, or zirconium.

ORGANIC CHEMISTRY - Preferred Component: The carbon source is an organic solvent from xylene, ethylene, or benzene. The first precursor material comprising the catalyst is a metallocene. The second precursor material comprising the dopant is tetrakis(diethylamino)titanium. Preferred Process: The catalyst is provided to the reactor at an atomic percentage of less than 0.75 (0.2-0.7) at. %. The dopant is provided to the reactor at an atomic percentage of 0.5-4 (1-3.5) at.%. One or both of the precursor materials are vaporized at less than 250degreesC (125-175degreesC). The reaction temperature is 650-850degreesC. The carbon source is provided to the reactor subsequent to when the vaporized mixture of precursor materials is heated to the reaction temperature.

ORGANIC CHEMISTRY - Preferred Component: The catalyst is iron. The dopant is titanium, hafnium, or zirconium.

FS CPI; EPI

MC CPI: E05-L01; E05-L02A; E05-N01; E05-U02; E11-G02; N05-B; N07-F02
EPI: U11-C01J6; U11-C18A; U12-B03F2

L61 ANSWER 22 OF 38 WPIX COPYRIGHT 2010

THOMSON REUTERS on STN

AN 2005-432269 [200544] WPIX Full-text

DNC C2005-132817 [200544]

DNN N2005-350486 [200544]
 TI Carbon nanotube fabrication system includes chamber, substrate, layer having opposed surfaces and catalyst site for growing carbon nanotube, and high intensity thermal radiation source for heating the chamber
 DC L02; L03; U11; V05
 IN ADDERTON D M; CHEN X S
 PA (ADDE-I) ADDERTON D M; (CHEN-I) CHEN X S
 CYC 1
 PI US 20050109280 A1 20050526 (200544)* EN 14[12]
 ADT US 20050109280 A1 Provisional US 2003-505360P 20030922; US 20050109280 A1 US 2004-945814 20040921
 PRAI US 2004-945814 20040921
 US 2003-505360P 20030922
 IPCR C01B0031-00 [I,C]; C01B0031-02 [I,A]; C23C0016-00 [I,A]; C23C0016-00 [I,C]; C23C0016-455 [I,A]; C23C0016-455 [I,C]; C23C0016-48 [I,A]; C23C0016-48 [I,C]; C23C0016-52 [I,A]; C23C0016-52 [I,C]
 EPC C01B0031-02B; C23C0016-455K2; C23C0016-48D; C23C0016-52
 ICO Y01N0006:00
 NCL NCLM 118/724.000
 AB US 20050109280 A1 UPAB: 20051222
 NOVELTY - A carbon nanotube fabrication system comprises a chamber (52) that supports a substrate (54), a substrate, and a layer on top of the substrate. The layer has upper and lower opposed surfaces and catalyst site(s) for growing a carbon nanotube. It also includes a high intensity thermal radiation source for heating the chamber. An increase in temperature at the substrate lags a temperature increase at the catalyst site.
 DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for a method of producing carbon nanotubes (CNTs) on a substrate, comprising heating a chamber to a CNT synthesis temperature faster than heating the chamber to the CNT synthesis temperature in thermal CVD, and synthesizing the carbon nanotubes in a process window defined by a difference in time between a point at which the CNT temperature is achieved and a point, tcool, at which the temperature at a top surface of the substrate achieves a glass transition temperature.
 USE - For the production of CNTs useful as metallic conductors, semi-conductors, insulators or diode junctions on a substrate.
 ADVANTAGE - The inventive carbon nanotube fabrication system can produce high quality carbon nanotubes on a wide range of substrates while preserving thermal budgets associated with the application.
 DESCRIPTION OF DRAWINGS - The figure is a schematic front elevational view of a rapid thermal vapor deposition system of the invention.
 Chamber (52)
 Substrate (54)
 Temperature regulation chuck (56)
 Reflector (80)
 TECH ELECTRONICS - Preferred Component: The source includes a reflector (80). A temperature regulation chuck (56) is provided that supports the substrate, and cools the substrate to prevent damage. The layer is a thick film superstructure having upper and lower opposed surfaces. Preferred Condition: A CNT synthesis temperature is achieved from an ambient temperature in less than 1 minute, preferably less than 30 seconds.
 FS CPI; EPI
 MC CPI: L02-A02B; L02-H04B; L03-A02B; L03-A03B
 EPI: U11-C01B; U11-C01J6; U11-C09B; V05-L01A3A; V05-L05B5
 L61 ANSWER 23 OF 38 WPIX COPYRIGHT 2010 THOMSON REUTERS on STN
 AN 2005-121231 [200513] WPIX Full-text
 DNC C2005-040262 [200513]

TI Continuous production of fullerene-related carbon nanotubes and fullerenes, by providing mixture of carbon vapor with noble gas flow for maintaining optimal concentration of carbon and catalyst vapor in vapor generation zone

DC E36; F01; G01; L02

IN KOULIKOV D

PA (KOUL-I) KOULIKOV D

CYC 1

PI US 20050019245 A1 20050127 (200513)* EN 9[4]

ADT US 20050019245 A1 US 2003-623871 20030721

PRAI US 2003-623871 20030721

IPCR C01B0031-00 [I,C]; C01B0031-02 [I,A]; D01F0009-12 [I,C]; D01F0009-127 [I,A]; D01F0009-133 [I,A]

EPC C01B0031-02B; D01F0009-127; D01F0009-133

ICO Y01N0006:00

NCL NCLM 423/447.300

NCLS 422/190.000; 422/198.000

AB US 20050019245 A1 UPAB: 20050708

NOVELTY - Continuous production of fullerene-related carbon nanotubes and fullerenes, comprises establishing vapor generation zone in atmosphere of noble gas by starting and maintaining direct current arc discharge between two graphite electrodes; providing jet flow of noble gas; and providing mixture of carbon vapor with noble gas flow for maintaining optimal concentration of carbon and catalyst vapor in vapor generation zone.

DETAILED DESCRIPTION - Continuous production of fullerene-related carbon nanotubes and fullerenes, comprises:

- (a) establishing vapor generation zone (7) in an atmosphere of a noble gas by starting and maintaining direct current arc discharge between two graphite electrodes (13), one of which is a movable consumable anode (8) and another one is a motionless non-consumable cathode (9);
- (b) providing jet flow of noble gas for maintaining an optimal temperature of anode end surface to suppress formation of large carbon clusters and micro-crystallite carbon particles in vapor generation zone;
- (c) providing mixture of carbon vapor with a noble gas flow for maintaining an optimal concentration of carbon and catalyst vapor in vapor generation zone to ensure optimal yields of carbon nanotubes and fullerenes;
- (d) continuous automated feeding of a movable anode into vapor generation zone;
- (e) continuous automated feeding of a catalyst for carbon nanotube synthesis in the form of a metal wire or a fine metal powder into vapor generation zone through central perforation in cathode body;
- (f) formation of condensables outside of vapor generation zone containing fullerene-related carbon nanotubes and fullerenes;
- (g) pneumatic transportation of condensables by a noble gas flow, their cooling, filtration and collection in a storage bin (4) and a noble gas flow re-circulation; and
- (h) automated discharge of condensables from the storage bin and recovery of carbon nanotubes and fullerenes.

An INDEPENDENT CLAIM is also included for device for continuous production of carbon nanotubes and fullerenes, which represents closed-loop system and includes:

- (i) an airtight water-cooled chamber (1) comprising an arc discharge section containing vapor generation zone between two graphite electrodes, an anode feeding section containing mechanism to provide automated jointing of separate graphite electrodes and their gradual transportation into vapor generation zone and a catalyst feeding section containing mechanism to provide continuous supply of catalyst through central perforation in cathode body into vapor generation zone;
- (ii) an interchangeable airtight plug-in cartridge containing multiple graphite electrodes for non-stop device operation;

(iii) an interchangeable airtight plug-in cartridge containing catalyst in a form of metal wire or a fine metal powder for non-stop device operation;

(iv) jet flow of noble gas for maintaining an optimal temperature of anode surface and an optimal concentration of carbon vapor in vapor generation zone comprising at least one gas nozzle and at least one gas distributor placed within arc discharge section of the airtight chamber;

(v) two conveyor transporters for pneumatic transporting of the condensables and noble gas flow re-circulation;

(vi) a heat exchanger to maintain constant temperature of the re-circulating noble gas flow comprising mechanism for continuous cleaning heat exchanger inner walls from the condensables;

(vii) a filter (3) to separate the condensables from a noble gas flow comprising mechanism for filter automatic self-cleaning; and

(viii) a storage bin for filtered condensables comprising a mechanism for automated discharge of the condensables outside of a storage bin.

USE - Continuous production of fullerene-related carbon nanotubes and fullerenes (claimed).

ADVANTAGE - The closed-loop device for continuous production of carbon nanotubes and fullerenes comprises continuous automated feeding of graphite electrodes and catalyst into vapor generation zone, usage of airtight interchangeable plug-in cartridges providing uninterrupted source of fresh carbon and catalyst, and pneumatic transportation of condensables and their automated discharge outside of the closed-loop device.

DESCRIPTION OF DRAWINGS - The figure is a schematic illustration of a device for continuous production of fullerene-related carbon nanotubes and fullerenes.

Water-cooled chamber (1)
Filter (3)
Storage bin (4)
Vapor generation zone (7)
Anode (8)
Cathode (9)
Graphite electrodes (13)

TECH INORGANIC CHEMISTRY - Preferred Method: Precautions are taken to prevent melting of catalyst material inside the cathode body while catalyst is fed into vapor generation zone through perforation in cathode body. The catalyst for carbon nanotubes synthesis is supplied in the form of a metal wire or a fine metal powder and the mechanism for its continuous supply into vapor generation zone is presented by any standard or customized wire or powder feeder.

MECHANICAL ENGINEERING - Preferred Component: The two conveyor transporters are equipped with spring clamps tightly embracing the electrodes from the two opposite sides. Recirculation of a noble gas flow is accomplished by oil-less gas pump and oil-less gas compressor. Screw conveyor accomplishes continuous cleaning of condensables from the heat exchanger inner walls.

FS CPI

MC CPI: E05-U02; E05-U03; F01-D09A; G01-A11; L02-H04B

=> d 30-38 ibib abs ind

L61 ANSWER 30 OF 38 PASCAL COPYRIGHT 2010 INIST-CNRS. ALL RIGHTS RESERVED. on STN DUPLICATE 2

ACCESSION NUMBER: 2004-0552773 PASCAL Full-text
COPYRIGHT NOTICE: Copyright .COPYRGT. 2004 INIST-CNRS. All rights reserved.

TITLE (IN ENGLISH): Carbon nanotubes with 2D and 3D multiple junctions

AUTHOR: TING Jyh-Ming; LI Tsung-Pei; CHANG Chi-Chih

CORPORATE SOURCE: Department of Materials Science and Engineering,
National Cheng Kung University, 1 University Road,
Tainan 701, Taiwan, Province of China

SOURCE: Carbon : (New York, NY), {2004}, 42(14),
2997-3002, 24 refs.
ISSN: 0008-6223 CODEN: CRBNAH

DOCUMENT TYPE: Journal

BIBLIOGRAPHIC LEVEL: Analytic

COUNTRY: United Kingdom

LANGUAGE: English

AVAILABILITY: INIST-11401, 354000120430720240

AN 2004-0552773 PASCAL Full-text

CP Copyright .COPYRGT. 2004 INIST-CNRS. All rights reserved.

AB Multiple junction CNTs and 3D junction CNTs were obtained using a thermal chemical vapor deposition method without using a template substrate. The silicon substrates used were simply scratched using various types of abrasives prior to the growth of carbon nanotube. The hydrocarbon gas used was methane, which was balanced by hydrogen. A total of four catalyst precursors, Fe powders, Ni powders, FeS powders, and ferrocene, were used. It was found that only the use of ferrocene gave the formation of multiple junction CNTs. These multiple junction CNTs are found and suspended exclusively in the scratched striations. The mechanism of (multiple) junction CNT formation is discussed by addressing the role of the substrate and the catalyst.

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CC 001B80A05T; Physics; Materials science

CCFR 001B80A05T; Physique; Science des matériaux

CCES 001B80A05T; Física; Ciencia de los materiales

CT Carbon nanotubes; Silica; Junctions; CVD; Catalysts; Substrates

CTFR Nanotube carbone; Silice; Jonction; Depot chimique phase vapeur; Catalyseur; Substrat; 8105U

BT Transition elements

BTFR Metal transition

L61 ANSWER 31 OF 38 PASCAL COPYRIGHT 2010 INIST-CNRS. ALL RIGHTS RESERVED. on STN DUPLICATE 3

ACCESSION NUMBER: 2002-0305841 PASCAL Full-text

COPYRIGHT NOTICE: Copyright .COPYRGT. 2002 INIST-CNRS. All rights reserved.

TITLE (IN ENGLISH): Low-temperature catalytic growth of carbon nanotubes under microwave plasma assistance
Catalysis and Plasma Technology

AUTHOR: XIZHANG WANG; ZHENG HU; QIANG WU; YI CHEN
JANG Ben W.-L. (ed.); REYNOLDS John G. (ed.);
BOUTONNET Magali (ed.); SPIVEY James J. (ed.)

CORPORATE SOURCE: Laboratory of Mesoscopic Materials Science,
Department of Chemistry, Nanjing University,
Nanjing 210093, China
Department of Chemistry, Texas A&M
University-Commerce, P.O. Box 3011, Commerce, TX
75429-3011, United States; Lawrence Livermore
National Lab., P.O. Box 808 L-092, Livermore, CA
94551, United States; Department of Chemical
Engineering and Technology, The Royal Institute of
Technology, 10044 Stockholm, Sweden; Department of
Chemical Engineering, North Carolina State
University, Raleigh, NC 27695, United States

SOURCE: Catalysis today, {2002}, 72(3-4),
205-211, 27 refs.

ISSN: 0920-5861 CODEN: CATTEA

DOCUMENT TYPE: Journal

BIBLIOGRAPHIC LEVEL: Analytic

COUNTRY: Netherlands

LANGUAGE: English

AVAILABILITY: INIST-21357, 354000100912970040

AN 2002-0305841 PASCAL Full-text

CP Copyright .COPYRGT. 2002 INIST-CNRS. All rights reserved.

AB Various carbon nanotubes (CNTs) including aligned arrays, Y- branching and some other novel morphologies have been catalytically grown on anodic porous alumina template (APAT) and on the alumina-supported catalysts with methane (or benzene) as carbon source under microwave plasma assistance below 520 °C. The growth process could be simply operated since neither heating nor bias-voltage was applied to the catalysts or APAT. The results presented in this paper not only greatly richened the nanostructures of carbon family but also provided with a new technique path for synthesizing CNTs or some other nanostructures with the characteristics of low-temperature which has some special advantages or applications.

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CC 001C01A03A; Chemistry; General chemistry, Physical chemistry; Catalysis
001C01J02; Chemistry; General chemistry, Physical chemistry; Colloidal state, Dispersed states

CCFR 001C01A03A; Chimie; Chimie generale, Chimie physique; Catalyse
001C01J02; Chimie; Chimie generale, Chimie physique; Etat colloidal, Etats disperses

CCES 001C01A03A; Quimica; Quimica general, Fisicoquimica; Catalisis
001C01J02; Quimica; Quimica general, Fisicoquimica; Estado coloidal, Estados dispersados

CT Nanotube; Carbon; Growth; Catalytic reaction; Alumina; Plasma; Chemical vapor deposition; Nanostructure;
Low temperature; Transmission electron microscopy; Supported catalyst; Methane; Hydrocarbon; Alkane; Benzene; Iron; Nickel; Heterogeneous catalysis

CTFR Nanotube; Carbone; Croissance; Reaction catalytique; Alumine; Plasma; Depot chimique phase vapeur; Nanostructure; Basse temperature; Microscopie electronique transmission; Catalyseur sur support; Methane; Hydrocarbure; Alcane; Benzene; Fer; Nickel; Catalyse heterogene

CTES Nanotubo; Carbono; Crecimiento; Reaccion catalitica; Alumina; Plasma; Deposito quimico fase vapor; Nanoestructura; Baja temperatura; Microscopia electronica transmision; Catalizador sobre soporte; Metano; Hidrocarburo; Alcano; Benceno; Hierro; Niquel; Catalisis heterogenea

BT Transition metal

BTFR Metal transition

BTES Metal transicion

L61 ANSWER 32 OF 38 PASCAL COPYRIGHT 2010 INIST-CNRS. ALL RIGHTS RESERVED. on STN

ACCESSION NUMBER: 2004-0022511 PASCAL Full-text

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TITLE (IN ENGLISH): Synthesis procedures for production of carbon nanotube junctions
Nanotechnology : Maspalomas, 19-21 May 2003

AUTHOR: KIRICSI Imre; KONYA Zoltan; NIESZ Krisztian; KOOS Antal A.; BIRO Laszlo P.
VAJTAI Robert (ed.); AYMERICH Xavier (ed.); KISH

CORPORATE SOURCE: Laszio B. (ed.); RUBIO Angel (ed.)
Applied and Environmental Chemistry Department,
University of Szeged, Rerrich Bela ter 1, 6720
Szeged, Hungary; Research Institute for Technical
Physics and Materials Science, P.O. Box 49, 1525
Budapest, Hungary

SOURCE: International Society for Optical Engineering,
Bellingham WA, United States (patr.)
SPIE proceedings series, (2003), 5118,
280-287, 30 refs.
Conference: Nanotechnology. Conference,
Maaspalomas (Spain), 19 May 2003
ISSN: 1017-2653
ISBN: 0-8194-4978-4

DOCUMENT TYPE: Journal; Conference

BIBLIOGRAPHIC LEVEL: Analytic

COUNTRY: United States

LANGUAGE: English

AVAILABILITY: INIST-21760, 354000117377990310

AN 2004-0022511 PASCAL Full-text

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AB Two different procedures of the preparation of carbon nanotube junctions were achieved. In the first method carboxyl groups were generated onto the outermost wall of multiwall carbon nanotubes and converted to carbonyl chloride groups by reaction with SOCl₂ at room temperature. The formed COCl groups are very reactive on the outer surface and can be reacted easily with various amines, particularly diamines resulting in the formation of amide bonding. When two functionalized carbon nanotubes react with such a diamine molecule interconnection of tubes is generated. The resulted carbon nanotube junctions have been investigated by TEM and AFM. The second method demonstrates a novel principle: catalyst material has been deposited on the outer surface of carbon nanotubes and branches of nanotubes were produced at this contact point by catalytic chemical vapor deposition (CCVD) of acetylene. The product has been characterized by TEM.

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CC 001B80A07D; Physics; Materials science
001B80A16H; Physics; Materials science

CCFR 001B80A07D; Physique; Science des materiaux
001B80A16H; Physique; Science des materiaux

CCES 001B80A07D; Fisica; Ciencia de los materiales
001B80A16H; Fisica; Ciencia de los materiales

PAC 8107D; 8116H

CT Experimental study; Nanotechnology; Nanostructured materials;
Nanotubes; Carbon; Interconnections; Junctions;
Functionalization; CVD; Catalytic reaction; Hot wire;
Fabrication

CTFR Etude experimentale; Nanotechnologie; Nanomateriau; Nanotube;
Carbone; Interconnexion; Jonction; Fonctionnalisation; Depot chimique
phase vapeur; Reaction catalytique; Fil chaud; Fabrication; 8107D;
8116H; Jonction Y; C

CTES Funcionalizacão; Reacción catalítica; Hilo caliente

BT Nonmetals

BTFR Non metal

L61 ANSWER 33 OF 38 PASCAL COPYRIGHT 2010 INIST-CNRS. ALL RIGHTS
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ACCESSION NUMBER: 2002-0028506 PASCAL Full-text

TITLE (IN ENGLISH): Direct nanowiring of carbon nanotubes for high
integrated electronic and spintronic devices

AUTHOR: LEE Y. H.; JANG Y. T.; CHOI C. H.; KIM D. H.; LEE

C. W.; LEE J. E.; HAN Y. S.; YOON S. S.; SHIN J. K.; KIM S. T.; KIM E. K.; JU B. K.
 CORPORATE SOURCE: Korea Inst. of Sci. and Technology, Seoul, Korea, Republic of
 SOURCE: Advanced Materials, {2001}, 13(18), 1371-1373, 14 refs.
 ISSN: 0935-9648 CODEN: ADVMEW
 DOCUMENT TYPE: Journal
 BIBLIOGRAPHIC LEVEL: Analytic
 COUNTRY: Germany, Federal Republic of
 LANGUAGE: English
 AVAILABILITY: INIST-22427
 AN 2002-0028506 PASCAL [Full-text](#)
 AB Carbon nanotubes were directly nanowired using growth barrier technology utilizing chemical vapor deposition (CVD) at the relatively low process temperature of 650-750°C. Using this method, CNTs bridging two parallel patterned structures with a perfect "Y-junction" or "straight line" were formed.
 CC 001B60A50; Physics; Condensed matter physics, Materials science; Crystallography
 001D03F; Applied sciences; Electronics; Microelectronics, Solid state devices
 001D08A01; Applied sciences; Chemistry; Chemical industry
 001D07; Applied sciences; Chemical engineering
 001B00E70; Physics; Thermodynamics
 001D08A02; Applied sciences; Chemistry; Chemical industry
 CCFR 001B60A50; Physique; Physique de l'etat condense, Science des materiaux; Cristallographie
 001D03F; Sciences appliquees; Electronique; Microelectronique, Dispositifs a l'etat solide
 001D08A01; Sciences appliquees; Chimie; Industrie chimique
 001D07; Sciences appliquees; Genie chimique
 001B00E70; Physique; Thermodynamique
 001D08A02; Sciences appliquees; Chimie; Industrie chimique
 CCES 001B60A50; Fisica; Fisica del estado condensado, Ciencia de los materiales; Cristalografia
 001D03F; Ciencias aplicadas; Electronica; Microelectronica, Dispositivos en el estado solido
 001D08A01; Ciencias aplicadas; Quimica; Industria quimica
 001D07; Ciencias aplicadas; Ingenieria quimica
 001B00E70; Fisica; Termodinamica
 001D08A02; Ciencias aplicadas; Quimica; Industria quimica
 CT Direct nanowiring; Growth barrier technology; Dry oxidation; Field emission scanning electron microscopy; Application; Nanotechnology; Growth (materials); Chemical vapor deposition; Low temperature operations; Photolithography; Thermodynamic stability; Silica; Oxidation; Scanning electron microscopy; Catalysts; Magnetic properties; Carbon nanotubes; Experiments
 CTFR Application; Nanotechnology; Croissance materiau; Depot chimique phase vapeur; Operation basse temperature; Photolithographie; Stabilité thermodynamique; Silice; Oxydation; Microscopie électronique balayage; Catalyseur; Propriété magnétique; Nanotube carbone; Experience
 CTES Aplicacion
 L61 ANSWER 34 OF 38 COMPENDEX COPYRIGHT 2010 EEI on STN
 ACCESSION NUMBER: 2005-018769371 COMPENDEX [Full-text](#)
 TITLE: Ethanol electrooxidation on a carbon-supported Pt catalyst: Reaction kinetics and product yields

AUTHOR(S): Wang H.; Jusys Z.; Behm R.J.
 CORPORATE SOURCE: Wang H.; Jusys Z.; Behm R.J. (Department Surface Chemistry, University of Ulm, D-89069 Ulm (DE))
 EMAIL: zenonas.jusys@chemie.uni-ulm.de
 SOURCE: Journal of Physical Chemistry B (16 Dec 2004) Volume 108, Number 50, pp. 19413-19424, 34 refs.
 CODEN: JPCBFK ISSN: 1520-6106
 DOI: 10.1021/jp046561k
 Published by: American Chemical Society
 COUNTRY OF PUBLICATION: United States
 DOCUMENT TYPE: Journal; Article; Experimental
 LANGUAGE: English
 SUMMARY LANGUAGE: English
 ENTRY DATE: Entered STN: 4 Jan 2009
 Last updated on STN: 4 Jan 2009

AN 2005-018769371 COMPENDEX Full-text
 AB The ethanol oxidation reaction (EOR) on a carbon-supported Pt nanoparticle catalyst was studied by cyclic voltammetry and potential-step measurements as a function of ethanol concentration and reaction temperature (23-60°C), combining on-line mass spectrometric analysis of the reaction products and electrochemical current measurements. The effect of catalyst loading/electrode roughness was elucidated by comparison with a polycrystalline Pt electrode. Individual, absolute rates for CO₂ and acetaldehyde formation were determined via the doubly ionized carbon dioxide molecular ion at m/z = 22 and the CHO⁺ fragment at m/z = 29, whereas acetic acid yields were calculated as the difference between the Faradaic current (charge) and the sum of the partial currents for oxidation to CO₂ and acetaldehyde, calculated from the calibrated mass spectrometric currents. Incomplete ethanol oxidation to acetaldehyde and acetic acid prevails over complete oxidation to CO₂ under all conditions, the dominant products being acetic acid at low (1 mM) and acetaldehyde at high (0.5 M) ethanol concentration or low catalyst loading/electrode roughness, i.e., on the smooth Pt electrode, whereas current efficiency and product yield for CO₂ formation is on the order of a few percent. The reaction orders for ethanol on Pt/Vulcan are 0.3, 0.6, and 0.9 for CO₂, acetic acid, and acetaldehyde formation and 0.6 for the total Faradaic current, respectively. These trends are discussed in terms of increasing readsorption and subsequent oxidation of volatile, desorbing reaction intermediates with increasing catalyst loading/electrode roughness, considering that acetic acid oxidation is kinetically hindered at room temperature, and a rather low rate for C-C bond breaking under these conditions. The temperature dependence in this temperature range results in an apparent activation energy for the total reaction (Faradaic current) of 32 kJ/mol. The respective values for the partial reactions for CO₂, acetic acid and acetaldehyde formation are 20, 28, and 43 kJ/mol, respectively.

AN 2005-018769371 COMPENDEX Full-text
 CC 547.1 Precious Metals; 702.2 Fuel Cells; 741.1 Light and Optics; 801.4 Physical Chemistry; 802.2 Chemical Reactions; 804.1 Organic Compounds
 CT *Ethanol; Acetic acid; Catalysis; Chemical bonds; Fuel cells; Infrared spectroscopy; Oxidation; Platinum; Reaction kinetics
 ST Differential electrochemical mass spectrometry (DEMS); Direct alcohol fuel cells (DAFC); Ethanol oxidation; Ethanol oxidation reaction (EOR)
 ET Pt; Pt; C; C*O; CO; C cp; cp; O cp; C-C

L61 ANSWER 35 OF 38 COMPENDEX COPYRIGHT 2010 EEI on STN
 ACCESSION NUMBER: 2004-328302534 COMPENDEX Full-text
 TITLE: Simple catalyst for the direct growth of

carbon nanotubes onto substrate by chemical vapor deposition

AUTHOR(S): Liu Dengyou; Chen Jinhua; Deng Wei; Zhou Haihui; Kuang Yafei

CORPORATE SOURCE: Liu Dengyou; Chen Jinhua; Deng Wei; Zhou Haihui; Kuang Yafei (Stt. Key Lab. Chemo/Biosensing/C., Coll. of Chem./Chemical Engineering, Hunan University, Changsha, 410082 (CN))
EMAIL: chenjinhua@hnu.cn

SOURCE: Materials Letters (Sep 2004) Volume 58, Number 22-23, pp. 2764-2767, 29 refs.
CODEN: MLETDJ ISSN: 0167-577X
DOI: 10.1016/j.matlet.2004.04.032
Published by: Elsevier

PUBL. ITEM IDENTIFIER: S0167577X04002769

COUNTRY OF PUBLICATION: Netherlands

DOCUMENT TYPE: Journal; Article; Theoretical; Experimental

LANGUAGE: English

SUMMARY LANGUAGE: English

ENTRY DATE: Entered STN: 4 Jan 2009
Last updated on STN: 4 Jan 2009

AN 2004-328302534 COMPENDEX Full-text

AB Carbon nanotubes are grown directly on the graphite substrate using a simple catalyst prepared by electrochemical deposition in this paper. Compared with the current preparation methods of catalysts, electrochemical deposition is an effective, cheap and simple technique. By adjusting the electrodeposition parameters (current density and deposition time), the effects of the morphology and the particle size of iron (Fe) catalyst on the synthesis of carbon nanotubes have also been investigated. Furthermore, carbon nanotube Y junctions can be observed in this work. .COPYRG. 2004 Elsevier B.V. All rights reserved.

AN 2004-328302534 COMPENDEX Full-text

CC 933.1 Crystalline Solids; 804 Chemical Products Generally; 803 Chemical Agents and Basic Industrial Chemicals; 802.2 Chemical Reactions; 801.4.1 Electrochemistry; 741.1 Light and Optics; 731.1 Control Systems

CT *Carbon nanotubes; Catalysts; Chemical vapor deposition; Electrochemistry; Nanostructured materials; Parameter estimation; Scanning electron microscopy

ST Deposition time; Direct growth; Electrochemical deposition; Nanomaterials

ET Fe; Y

L61 ANSWER 36 OF 38 COMPENDEX COPYRIGHT 2010 EEI on STN

ACCESSION NUMBER: 2005-309260565 COMPENDEX Full-text

TITLE: Performance of PEMFC electrodes containing low-Pt loadings

AUTHOR(S): Uribe Francisco A.; Rockward Tommy; Valerio Judith A.; Adzic Radoslav R.

CORPORATE SOURCE: Uribe Francisco A.; Rockward Tommy; Valerio Judith A. (Los Alamos National Laboratory, MS D429, Los Alamos, NM 87545); Adzic Radoslav R. (Brookhaven National Laboratory, Materials Science Department, Bldg 555, Upton, NY 11973-5000)

SOURCE: 2004 Joint International Meeting - 206th Meeting of the Electrochemical Society/2004 Fall Meeting of the Electrochemical Society of Japan, MA 2004-02. Meeting Abstracts (2004), pp. 1857, 3 refs.
ISSN: 1091-8213

Published by: Electrochemical Society Inc.
 Conference: 2004 Joint International Meeting -
 206th Meeting of the Electrochemical Society/2004 Fall Meeting of
 the Electrochemical Society of Japan, Honolulu, HI (US), 3 Oct
 2004-8 Oct 2004

COUNTRY OF PUBLICATION: United States
 DOCUMENT TYPE: Conference; (Conference Paper); Theoretical;
 Experimental

LANGUAGE: English

SUMMARY LANGUAGE: English

ENTRY DATE: Entered STN: 4 Jan 2009

Last updated on STN: 4 Jan 2009

AN 2005-309260565 COMPENDEX [Full-text](#)

AB Despite the performance improvements achieved by PEMFC's in recent years, their practical implementation, particularly in transportation applications, has been hindered by the high cost of materials such as membranes, bipolar plates and catalysts. Only carbon supported Pt or Pt-alloys are capable of sustaining sufficient high power for long periods of time in the acidic environment existing in proton exchange membranes such as Nafion®. Therefore, the need to decrease Pt loadings (or find a replacement) is a major goal in PEMFC research. Here we present FC performance results obtained with catalyst loadings considerably under 100 µg Pt/cm² at the anode or the cathode. These catalysts have enhanced electroactivity and achieve a more complete Pt utilization. Preparation of these materials has resulted in low-loading electrocatalysts that contain submonolayer-to-monolayer amounts of Pt on nanoparticles of suitable carbon-supported metals or alloys. Two different catalysts have been tested in fuel cell operation, an anode catalyst consisting of Pt islands on Ru nanoparticles and a cathode catalyst consisting of a Pt monolayer on Pd nanoparticles. Figure 1 shows a long-term test of a cell with an anode loaded with 18 µg Pt/cm² (2 w% Pt-20% Ru/C, BNL). The cell was operated with variable fuel composition (neat H₂ for 630 hr and H₂ + 50 ppm CO + 3% air bleed for 238 hr). The cell did not experience voltage loss (within experimental error) operating on neat hydrogen. This result demonstrates long-term stability of the catalyst despite the very low-Pt content. As expected from a catalyst containing a Pt-Ru alloy, it also presented good tolerance to CO-contaminated H₂. The total loss running with CO was 12 mV compared to operation on neat H₂. Figure 2 shows performance of FC cathodes containing 40 µg Pt/cm² (c) and 77 µg Pt/cm² (b) (4w%Pt-20w%Pd/C,BNL). For comparison, a polarization curve obtained with a FC cathode containing 0.23 mg Pt/cm² (a) (20 w% Pt/C, ETEK) is also included. The performance of cell (b) relative to cell (a) represents a significant improvement in power output to platinum used, as indicated by the numbers of 1 the second column in Table I.

AN 2005-309260565 COMPENDEX [Full-text](#)

CC 931.3 Atomic and Molecular Physics; 804 Chemical Products Generally;
 803 Chemical Agents and Basic Industrial Chemicals; 933.1
 Crystalline Solids; 801.4.1 Electrochemistry; 702.2 Fuel Cells;
 547.1 Precious Metals; 704.1 Electric Components

CT *Electrodes; Catalysts; Electrochemistry; Fuel cells;
 Nanostructured materials; Palladium; Platinum; Platinum alloys;
 Protons

ST Electroactivity; Fuel cell operations; PEMFC; Pt loadings

ET Pt; Pt; Ru; Pd; H; C*O; CO; C cp; O cp; Pt*Ru; Pt sy 2; sy 2; Ru
 sy 2; Pt-Ru; I

L61 ANSWER 37 OF 38 COMPENDEX COPYRIGHT 2010 EEI on STN

ACCESSION NUMBER: 2005-078834920 COMPENDEX [Full-text](#)

TITLE: Ion irradiation effects on the structural
 deformation of multi-walled carbon nanotubes

AUTHOR(S): Cho Jung-Hyun; Kim Ok-Kyoung; Kim Gon-Ho

CORPORATE SOURCE: Cho Jung-Hyun; Kim Ok-Kyoung (Department of Physics, Hanyang University, Ansan, Kyunggi-Do, 425-791 (KR)); Kim Gon-Ho (Department of Nuclear Engineering, Seoul National University, Seoul, 151-741 (KR))

SOURCE: IEEE Conference Record - Abstracts: The 31st IEEE International Conference on Plasma Science, ICOPS2004. IEEE International Conference on Plasma Science (2004), pp. 237, 468 p.
CODEN: 85PSAO ISSN: 0730-9244
Published by: Institute of Electrical and Electronics Engineers Inc.
Conference: IEEE Conference Record - Abstracts: The 31st IEEE International Conference on Plasma Science, ICOPS2004
Baltimore, MD (US), 28 Jun 2004-1 Jul 2004
Organizer(s): IEEE Nuclear and Plasma Sciences Society; Army Research Office; Air Force Office of Research; Defense Threat Reduction Agency; Alameda Applied Sciences Corporation

COUNTRY OF PUBLICATION: United States
DOCUMENT TYPE: Conference; (Conference Paper); Experimental
LANGUAGE: English
SUMMARY LANGUAGE: English
ENTRY DATE: Entered STN: 4 Jan 2009
Last updated on STN: 4 Jan 2009

AN 2005-078834920 COMPENDEX Full-text
AB Doped nanotube has a potential step of a few eV at the junction responsible for the nonlinear conductivity so that the nano diode can be manufactured. In order to dope the N or P elements into nanotubes, it is necessary to open the end of the tubes. Here the ion irradiation method to open the end of the tubes was introduced. Experiments were carried out with various ion energies and fluxes of the irradiated ions to the multi-walled carbon nanotubes (MWNTs). The irradiated ion energy and flux can be controlled by the sheath potential and the ion plasma density near the tubes respectively. Emissive probe with the inflection point in the limit of zero emitting current method was applied to measure the sheath potentials and Langmuir probe was to measure the plasma densities near the tubes. MWNTs were grown in PECVD (Plasma Enhanced Chemical Vapor Deposition) reactor and the ion irradiation was carried out in the inductively coupled N₂ plasma. The morphology of irradiated MWNTs was studied by SEM and TEM images. It was observed that the catalyst was removed and the length of MWNTs linearly decreases with the incident ion energy and ion flux. The preliminary results show that the length of MWNTs decreases linearly with a ratio of 3.5nm/eV for increasing the irradiation ion energy from 100eV to 200eV. Above 200eV, almost of MWNTs were eliminated with remaining the small spot. With ion energies of 25-100eV, the catalysts were effectively removed from the top of MWNTs. Furthermore effect of the mass and flux of irradiation metallic ions on the deformation of MWNTs will be presented.

AN 2005-078834920 COMPENDEX Full-text
CC 932.3 Plasma Physics; 932.1 High Energy Physics; 802.2 Chemical Reactions; 933.1 Crystalline Solids; 741.3 Optical Devices and Systems; 714.2 Semiconductor Devices and Integrated Circuits; 714.1 Electron Tubes; 741.1 Light and Optics
CT *Ion bombardment; Carbon nanotubes; Deformation; Diodes; Plasma density; Plasma enhanced chemical vapor deposition; Scanning electron microscopy; Semiconductor junctions; Transmission electron microscopy
ST Emissive probe; Ion energy; Multi-walled carbon nanotube (MWNT); Nonlinear conductivity
ET N; P

L61 ANSWER 38 OF 38 COMPENDEX COPYRIGHT 2010 EEI on STN
 ACCESSION NUMBER: 2003-387641803 COMPENDEX Full-text
 TITLE: Synthesis procedures for production of carbon nanotube junctions
 AUTHOR(S): Kiricsi Imre; Konya Zoltan; Niesz Krisztian; Koos Antal A.; Biro Laszlo P.
 CORPORATE SOURCE: Kiricsi Imre; Konya Zoltan; Niesz Krisztian (Applied and Environ. Chem. Dept., University of Szeged, Rerrich Bela ter 1, H-6720 Szeged (HU)); Koos Antal A.; Biro Laszlo P. (Res. Inst. for Tech. Phys. Mat. Sci., P.O. Box 49, H-1525 Budapest (HU))
 SOURCE: Proceedings of SPIE - The International Society for Optical Engineering (2003) Volume 5118, pp. 280-287, 667 p., 30 refs.
 CODEN: PSISDG ISSN: 0277-786X
 DOI: 10.1117/12.501326
 Published by: SPIE
 Conference: Nonatechnology Maspalomas, Gran Canaria (ES), 19 May 2003-21 May 2003
 Organizer(s): SPIE
 COUNTRY OF PUBLICATION: United States
 DOCUMENT TYPE: Conference; (Conference Paper); Experimental
 LANGUAGE: English
 SUMMARY LANGUAGE: English
 ENTRY DATE: Entered STN: 4 Jan 2009
 Last updated on STN: 4 Jan 2009

AN 2003-387641803 COMPENDEX Full-text
 AB Two different procedures of the preparation of carbon nanotube junctions were achieved, hi the first method carboxyl groups were generated onto the outermost wall of multiwall carbon nanotubes and converted to carbonyl chloride groups by reaction with SOCl₂ at room temperature. The formed COCl groups are very reactive on the outer surface and can be reacted easily with various amines, particularly diamines resulting in the formation of amide bonding. When two functionalized carbon nanotubes react with such a diamine molecule interconnection of tubes is generated. The resulted carbon nanotube junctions have been investigated by TEM and AFM. The second method demonstrates a novel principle: catalyst material has been deposited on the outer surface of carbon nanotubes and branches of nanotubes were produced at this contact point by catalytic chemical vapor deposition (CCVD) of acetylene. The product has been characterized by TEM.

AN 2003-387641803 COMPENDEX Full-text
 CC 714.2 Semiconductor Devices and Integrated Circuits; 741.3 Optical Devices and Systems; 802.2 Chemical Reactions; 804.1 Organic Compounds; 933.1 Crystalline Solids
 CT *Carbon nanotubes; Amines; Atomic force microscopy; Carbonylation; Carboxylation; Chemical vapor deposition; Chlorine compounds; Semiconductor junctions; Sulfur compounds; Synthesis (chemical); Transmission electron microscopy
 ST Carbon nanotube junctions; Carbonyl group; Carboxyl groups; Catalytic chemical vapor deposition; Diamines
 ET Cl*O*S; SOCl₂; S cp; cp; O cp; Cl cp; C*Cl*O; COCl; C cp

=> d his nofile

(FILE 'HOME' ENTERED AT 09:44:20 ON 14 JUN 2010)

FILE 'HCAPLUS' ENTERED AT 09:44:31 ON 14 JUN 2010

L1 1 SEA SPE=ON ABB=ON PLU=ON US20070224104/PN
SEL RN

FILE 'REGISTRY' ENTERED AT 09:44:58 ON 14 JUN 2010

L2 10 SEA SPE=ON ABB=ON PLU=ON (10421-48-4/BI OR 1317-37-9/BI
OR 1333-74-0/BI OR 71-43-2/BI OR 7439-89-6/BI OR 7440-37-1/
BI OR 7440-44-0/BI OR 7440-48-4/BI OR 7782-44-7/BI OR
7783-06-4/BI)
L3 4 SEA SPE=ON ABB=ON PLU=ON L2 AND M/ELS
L4 1 SEA SPE=ON ABB=ON PLU=ON 7440-44-0/RN

FILE 'HCAPLUS' ENTERED AT 09:46:48 ON 14 JUN 2010

L5 438715 SEA SPE=ON ABB=ON PLU=ON L4
L6 660684 SEA SPE=ON ABB=ON PLU=ON L3
L7 QUE SPE=ON ABB=ON PLU=ON (L5 OR CARBON#) (3A) (NANOTUB#
OR NANOSTRUCTURE? OR NANOCRYST? OR NANOROD? OR NANOCOMPOSIT
? OR NANOSCAL? OR NANOPARTICL? OR NANO(A) (TUB# OR STRUCTUR
OR CRYST? OR ROD? OR COMPOSIT? OR SCAL? OR PARTICL?))
L8 QUE SPE=ON ABB=ON PLU=ON (L5 OR CARBON#) (3A) (BRANCH? OR
JUNCTION?) (3A) (NANOTUB# OR NANOSTRUCTURE? OR NANOCRYST? OR
NANOROD? OR NANOCOMPOSIT? OR NANOSCAL? OR NANOPARTICL? OR
NANO(A) (TUB# OR STRUCTUR? OR CRYST? OR ROD? OR COMPOSIT?
OR SCAL? OR PARTICL?))
L9 QUE SPE=ON ABB=ON PLU=ON METAL# OR METAL OXIDE# OR
METAL BORIDE# OR METAL FLUORIDE# OR METAL SULFIDE#
L10 QUE SPE=ON ABB=ON PLU=ON IMPREGNAT? OR PRECIPITAT? OR
SOL GEL? OR CHEMICAL VAPOR DEPOSITION? OR CVD# OR SPUTTERIN
G?
L11 10042 SEA SPE=ON ABB=ON PLU=ON L7 AND L9
L12 2154 SEA SPE=ON ABB=ON PLU=ON L10 AND L11
L13 13 SEA SPE=ON ABB=ON PLU=ON L8 AND L12
L14 13 SEA SPE=ON ABB=ON PLU=ON L8 AND L9 AND L10
L15 13 SEA SPE=ON ABB=ON PLU=ON (L13 OR L14)
L16 61 SEA SPE=ON ABB=ON PLU=ON L8 AND CATALY?
L17 37 SEA SPE=ON ABB=ON PLU=ON L16 AND L10
D HIT
L18 1 SEA SPE=ON ABB=ON PLU=ON L11 AND L1
L19 QUE SPE=ON ABB=ON PLU=ON (BRANCH? OR JUNCTION?) (3A) (L5
OR CARBON#) (3A) (NANOTUB# OR NANOSTRUCTURE? OR NANOCRYST?
OR NANOROD? OR NANOCOMPOSIT? OR NANOSCAL? OR NANOPARTICL?
OR NANO(A) (TUB# OR STRUCTUR? OR CRYST? OR ROD? OR COMPOSIT?
OR SCAL? OR PARTICL?))
L20 94 SEA SPE=ON ABB=ON PLU=ON L19 AND L11
L21 30 SEA SPE=ON ABB=ON PLU=ON L20 AND PROC/RL
L22 12 SEA SPE=ON ABB=ON PLU=ON L21 AND CATALY?
L23 19 SEA SPE=ON ABB=ON PLU=ON L15 OR L22
L24 21 SEA SPE=ON ABB=ON PLU=ON L17 AND PROC/RL
L25 34 SEA SPE=ON ABB=ON PLU=ON (L23 OR L24)
L26 19 SEA SPE=ON ABB=ON PLU=ON L9 AND L25
L27 28 SEA SPE=ON ABB=ON PLU=ON L10 AND L25
L28 34 SEA SPE=ON ABB=ON PLU=ON (L25 OR L26 OR L27)
L29 QUE SPE=ON ABB=ON PLU=ON (LOADING? OR FEEDING? OR

DELIVERING? OR SUPPLYING?) (A) CATALYST?
 L30 QUE SPE=ON ABB=ON PLU=ON EVAPORATION? OR DISPERSING? OR
 SPRAYING?
 L31 0 SEA SPE=ON ABB=ON PLU=ON L28 AND L29
 L32 2 SEA SPE=ON ABB=ON PLU=ON L28 AND L30
 L33 34 SEA SPE=ON ABB=ON PLU=ON L28 OR L31 OR L32
 L34 6 SEA SPE=ON ABB=ON PLU=ON L33 AND (1840-2004)/PRY,AY,PY
 L35 0 SEA SPE=ON ABB=ON PLU=ON L29 AND L19
 L36 74 SEA SPE=ON ABB=ON PLU=ON L29 AND L7
 L37 41 SEA SPE=ON ABB=ON PLU=ON L36 AND PROC/RL
 L38 12 SEA SPE=ON ABB=ON PLU=ON L37 AND (1840-2004)/PRY,AY,PY
 L39 12 SEA SPE=ON ABB=ON PLU=ON L38 NOT L34
 L40 12 SEA SPE=ON ABB=ON PLU=ON L35 OR L39
 L41 18 SEA SPE=ON ABB=ON PLU=ON L34 OR L40

FILE 'WPIX' ENTERED AT 10:37:21 ON 14 JUN 2010
 L42 QUE SPE=ON ABB=ON PLU=ON (BRANCH? OR JUNCTION?) (A) (CARBO
 N#) (A) (NANOTUB# OR NANOSTRUCTURE? OR NANOCRYST? OR
 NANOROD? OR NANOCOMPOSIT? OR NANOSCAL? OR NANOPARTICL? OR
 NANO(A) (TUB# OR STRUCTUR? OR CRYST? OR ROD? OR COMPOSIT?
 OR SCAL? OR PARTICL?))
 L43 0 SEA SPE=ON ABB=ON PLU=ON L42 AND L29
 L44 QUE SPE=ON ABB=ON PLU=ON (CARBON#) (3A) (NANOTUB# OR
 NANOSTRUCTURE? OR NANOCRYST? OR NANOROD? OR NANOCOMPOSIT?
 OR NANOSCAL? OR NANOPARTICL? OR NANO(A) (TUB# OR STRUCTUR?
 OR CRYST? OR ROD? OR COMPOSIT? OR SCAL? OR PARTICL?))
 L45 37 SEA SPE=ON ABB=ON PLU=ON L44 AND L29
 L46 9 SEA SPE=ON ABB=ON PLU=ON L45 AND (L10 OR L30)
 L47 9 SEA SPE=ON ABB=ON PLU=ON L43 OR L46
 L48 1 SEA SPE=ON ABB=ON PLU=ON US20070224104/PN
 L49 QUE SPE=ON ABB=ON PLU=ON ELECTRODE# OR TRANSISTOR? OR
 ELECTRONIC? OR NANOELECTRONIC? OR REINFORCING AGENT? OR
 REINFORCING POLYMER? OR ELECTROCHEMICAL PRODUCT?
 L50 11 SEA SPE=ON ABB=ON PLU=ON L45 AND L49
 L51 2564 SEA SPE=ON ABB=ON PLU=ON L44 AND CATALYST?
 L52 45 SEA SPE=ON ABB=ON PLU=ON L51 AND (BRANCH? OR JUNCTION?)
 L53 13 SEA SPE=ON ABB=ON PLU=ON L52 AND (L10 OR L30)
 L54 29 SEA SPE=ON ABB=ON PLU=ON L47 OR L50 OR L53 OR L43
 L55 12 SEA SPE=ON ABB=ON PLU=ON L54 AND (PRY<2005 OR PY<2005
 OR AY<2005)

FILE 'JAPIO' ENTERED AT 10:57:40 ON 14 JUN 2010
 L56 0 SEA SPE=ON ABB=ON PLU=ON L54 AND (PRY<2005 OR PY<2005
 OR AY<2005)

FILE 'PASCAL' ENTERED AT 10:58:11 ON 14 JUN 2010
 L57 4 SEA SPE=ON ABB=ON PLU=ON L54 AND (PRY<2005 OR PY<2005
 OR AY<2005)

FILE 'COMPENDEX' ENTERED AT 11:01:57 ON 14 JUN 2010
 L58 7 SEA SPE=ON ABB=ON PLU=ON L54 AND (PRY<2005 OR PY<2005
 OR AY<2005)

FILE 'DISSABS' ENTERED AT 11:05:01 ON 14 JUN 2010
 L59 0 SEA SPE=ON ABB=ON PLU=ON L54 AND (PRY<2005 OR PY<2005
 OR AY<2005)

FILE 'CONFSCI' ENTERED AT 11:05:26 ON 14 JUN 2010
 L60 0 SEA SPE=ON ABB=ON PLU=ON L54 AND (PRY<2005 OR PY<2005
 OR AY<2005)

FILE 'HCAPLUS, WPIX, PASCAL, COMPENDEX' ENTERED AT 12:00:41 ON 14 JUN
2010

L61 38 DUP REM L41 L55 L56 L57 L58 L59 L60 (3 DUPLICATES REMOVED)
 ANSWERS '1-18' FROM FILE HCAPLUS
 ANSWERS '19-29' FROM FILE WPIX
 ANSWERS '30-33' FROM FILE PASCAL
 ANSWERS '34-38' FROM FILE COMPENDEX